Gas Journal

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Editorial Notes

National Fuel Policy

THE Government's lack of balance and the absence of any broad policy in relation to fuel problems are causing concern in the Gas Industry. This concern was voiced by Sir David Milne-Watson in the powerful Address he delivered at the recent Conference of the British Commercial Gas Association. Sir David urged that the Government should take particular care, in any new legislation relating to coal or electricity, that the interests of the Gas Industry should not be ignored, that no provisions should be passed which might hamper or handicap it in the service it is rendering to the community. He asked that the Government should weigh and evaluate the merits of the three fuel industries of coal, gas, and electricity and that they should recognize the impossibility of dealing fairly by the nation as a whole in the matter of fuel development and output unless due consideration is given to the importance of the Gas Industry. He asked that they should pause and take a wider view before adopting legislative action without safeguards on the basis of the McGowan Report, which " is to a large extent an elaborate sales programme for the electricity industry." With clarity Sir David put the case for the Gas Industry, as a great public utility, in relation to coal and electricity, emphasizing that the Gas Industry would welcome competition on a fair and economic basis without hidden subsidies or distorting factors of any kind.

Our country cannot afford to continue in this unbalanced state. No one would deny the value of competition, the stimulus it gives to development, but the present confused thought is against public interest and national welfare. The remedy lies in a long-term fuel policy on the broadest lines, formulated after full consideration of all the interests concerned and the possibilities which lie ahead. In this regard the Presidential Address which Sir Philip Dawson delivered last Thursday before the Institute of Fuel is of importance and commands the close attention of all fuel interests. It has already created wide public interest. In this Address, which embodies the results of close collaboration of men who have devoted their lives to the fuel industry, Sir Philip deals with the whole problem of our fuel resources on the broadest lines—on what has been done, what is being done, and what he suggests could be done to utilize to the full the greatest source of our national wealth. The Address is an accurate survey, and every proposal and practically every word have, we are told, been " weighed, carefully considered, and fully discussed."

For all who desire a clear-cut picture of the development of the fuel industries of this country the Address will prove an exceedingly useful reference; we are concerned here, however, with the suggestions put forward regarding likely trends. Sir Philip Dawson expresses the view that future progress in gas manufacture is not likely to alter materially gas production *per se*, but will be more concerned with gas purification and distribution; and in this connection he mentions that the application of higher pressures than used at present would solve problems common to both—in purification it would, for example, facilitate the combined recovery of ammonia and hydrogen sulphide. We may here remark, however, that should the complete gasification process employing oxygen under pressure be developed to produce a useful therm of gas at a cost comparable with a useful therm in solid fuel, then the whole situation of gas and coke would undergo a change, and gas production would certainly be materially altered. It seems, though, that the day is distant when all solid fuels will be excluded from the domestic market, and gas undertakings must continue to be producers of solid fuel as well as fuel in gaseous form. " The immediate future development of the Gas Industry," states Sir Philip, " must aim at striking an economic balance between gas and coke production, and the sale of these commodities at the lowest possible price." We have emphasized the significance of this " economic balance " many times in these columns; and it might suit the Industry and satisfy fuel requirements if it became more of a solid fuel industry.

Turning to the coking industry, Sir Philip points to the fact that new ovens of an aggregate daily capacity of about 20,000 tons of coal have been erected during the past two years, being partly replacements and partly additions. The latter, with a capacity of 8,000 tons a day, are " intended to supply the domestic and small industrial market." It must be expected that the coking industry will continue to cater for the domestic and small industrial consumers, but the market is capable of ab-

sorbing a great deal more coke. If only one coke grate were installed in each household in Great Britain an outlet for 22 million tons of coke per annum would be provided —double the present consumption of gas coke and oven coke for domestic and small industrial purposes. Coke grates are being installed at the rate of 100,000 a year. But, as we have emphasized so often, development in the field should be a joint effort for a national organization embracing both the Gas Industry and the coke oven industry. The London and Counties Coke Association has pointed the way. In his Address Sir Philip Dawson maintains strongly that the smoke nuisance calls for drastic action. " In spite of years of intermittent agitation, nothing is done officially on this question from the viewpoint of conservation of those coals which are responsible for the nuisance and which comprise our most valuable asset. Laws applied to the industrial chimney should in some degree be extended to the domestic chimney."

Production of Motor Spirit

LINKED up with plants built for carbonization, he suggests, should be central installations for treating the by-products. Based on the country's requirements of the chemical products obtainable, a comprehensive production plan should be worked out so that a situation is not developed which would cause over-production of any one commodity and lead to depressed markets, such as have existed for many years in the pitch industry. Utilization of by-products should be considered in conjunction with the production of motor fuels by such processes as hydrogenation and liquid fuel synthesis from coal. " Such schemes will have to come gradually. They will, however, never come unless a definite programme is established with the firm intention of achieving these aims at the earliest possible time." On the question of liquid fuel, Sir Philip urges a greater measure of Government action. He points to the fact, for example, that the Fischer-Tropsch process is admirably suited for operation in conjunction with coking plants. Such a combination, directed to the production of motor fuels, envisages carbonizing suitable coal at low temperatures for domestic fuel, gasification of breeze for gas production for the synthesis of motor spirit, and the cracking of the low temperature tar produced. The whole matter, he says, should be looked at from the national viewpoint. " Ways and means can be found of fitting in private interests to the scheme; but if the reverse be attempted —fitting the national scheme to suit private interests—experience gives little hope of any real progress."

Sir Philip says that, in comparison with certain other countries, we are following rather than leading in developing oil from coal processes—which, of course, is perfectly true—and he remarks that there is no doubt that within another three years Germany will cover her entire demands of motor spirit and gas oil from home-produced materials, and the synthetic production of lubricating oil is likewise making headway. The economics of the situation must be considered, however. As the Secretary for Mines observed at the recent Conservative Conference, it is technically established that oil can be made from coal. It is equally well established that bananas can be grown in greenhouses. It does not follow that a home grown banana industry would necessarily be a good thing for this country. And, for National Defence, it is vital for this country to maintain safe communications; otherwise there would be a disastrous lack of essential supplies other than oil. *The Times* of Saturday last, commenting on Sir Philip's Address, roundly stated that any huge increase of home-produced supplies of oil must in present circumstances be ruled out. " The process " —we quote from the leading article—" will be slow and uneconomic. But there need be no alarm on that account. Since the continuance of supplies by quicker and cheaper methods can be assured, the question of expanding home-produced supplies can be studied calmly and without wholly disregarding economic and financial considerations. There is a clear case for maintaining the encouragement of processes whose technical merit has been or can be proved, and whose contribution to the supplies required is already useful, if small." Encouragement must be given continuously to the development of such processes, and encouragement should be given, too, to other methods of rendering this country less dependent on imported oil. As we said in these columns last week, given encouragement, developments in the application of compressed coal gas, possibly enriched, would be accelerated, and in another direction, the preparation of reactive cokes for use in producer-gas driven motor lorries, work could proceed on a more ambitious scale and with far-reaching results.

Proposed Central Body

THE whole Address concentrates on the central point of co-ordination, and " there can be only one centralizing authority, and that is the Government." This, Sir Philip hastens to add, does not mean Government control, but a central body to collect and analyze all the available experience and knowledge and to define the most suitable policy for development in the national interest. His proposals are for a body which shall be advisory only, without executive power other than that essential for the collection of all necessary information. " Let us remember," he observes, " that we are at the beginning of a new era. We are at the beginnning of an era which is to treat coal as the raw material of a manufacturing process." We must think nationally in fuel problems.

In order to co-ordinate the whole of the power and heating requirements of the country, it is recommended that a new permanent body be created by Act of Parliament. " This central body should be under the control of a highly qualified person, capable of creating and organizing the necessary machinery for the collection and co-ordination of all information relative to the utilization of fuel, and with power to call evidence from authorities throughout the different industries. Such a body should have power, together with the necessary finance, to provide a suitable staff for the carrying out of this work. It should also have power to create a suitable advisory body, composed of technical and commercial authorities from the different industries, and to call for any other advice which might be considered necessary for the fullest investigation of our national fuel problems. . . . The work of this body would make clear the road for each section of industry to travel, with a clear field for unfettered development, and new roads would be open for increasing the output of the coal mining industry, with increased employment. . . . Industry in this great country has been built up upon our native coal; but the time has now arrived when we must reconsider our position and plan to build under the conditions of a new era, in which coal will be the raw material for satisfying our modern demands in new forms. The new era demands a smokeless and pure atmosphere in which to live, and suit-

able solid, liquid, and gaseous fuels for each and every section of our national activities."

It will be particularly noted that Sir Philip Dawson's proposed link between the State and the fuel industries would be without executive power other than that needed for the collection of information, and that he envisages for each section of the fuel industry a " clear field for unfettered development." The information which could be collected about the Gas Industry and put forward impartially could not do otherwise than assist in correcting the present unbalance of Government and in consequence public opinion regarding the claims and merits of the three fuel industries of this country. The Gas Industry desires not further Government control but greater recognition of its economic importance and of its flexibility in meeting probable requirements at a time of national emergency. It would welcome a " clear field for unfettered development."

All-Electric Flats

We continually encounter the description " all-electric " given to working-class flats and dwellings which in fact are nothing of the kind. In a recent issue *The Times* gave an account of a newly-projected block of working-class flats which they designated as " all-electric." Their report made it clear that in these flats there is to be a coal range in the living room which is designed to supply the living room heating, a big share of the cooking for six or eight months of the year, and the bulk of the hot water. How can this be a block of " all-electric " working-class flats? In a letter to *The Times* last week Sir David Milne-Watson called attention to this " prevalent and important piece of verbal conjuring." He was not complaining particularly of the use of the term by *The Times*, but of its common employment to describe any similar installation in London and provincial working-class households if an electric cooker stands in the kitchen as pretext.

There is no " all-electric " working-class dwelling in which the main fuel services are not provided by a coal range. Sir David observed in the letter to which we refer that, so far as careful investigation shows, there is no " all-electric " flat or house in which the tenant spends substantially less on coal than he does on electric current—in many instances he spends more. The point of Sir David's letter—it is a very important point—is that the continued use of this glamorous " all-electric " label is actively misleading to public opinion upon some of the issues which must now be before the Government in framing its proposals for the future of the electricity industry. " All-electric " working-class flats are not smokeless and do not provide more than a partial and limited fuel-on-tap service. It is most necessary, in the national interest and in the interest of the Gas Industry, that these facts should be brought to the public notice; and it is a duty of everyone connected with the Gas Industry, whatever his rôle in the Industry, to help in making the facts known and correcting a highly misleading conception.

Tenants of so-called " all-electric " houses are encouraged to use their coal fires during the winter months because it is cheaper for themselves and it keeps the cooker off the peak load. The electricians could not cope with the all-electric working-class dwelling. An " all-gas " house is in quite a different category; and where, as is often the case, the Gas Industry's solid product is employed to effect a certain amount of heating, the Industry has no fear of making the fact known, for coke is smokeless and materially assists the aim of a clean atmosphere. Moreover its use can safely and economically be limited to the living room hearth, cooking and water heating being genuinely automatic.

The Autumn Research Meeting

Judging from the programme which has been arranged, the Ninth Autumn Research Meeting of The Institution of Gas Engineers, which is to take place in London on Nov. 2 and 3, should prove one of the most interesting and helpful ever held. Thirteen Communications are to be presented and, with one exception, discussed. The exception is the Paper by Dr. J. G. King and Mr. James Jamieson on the low-temperature carbonization of Scottish cannel, which was published in full in last week's " Journal." This parallel investigation follows on that on the high-temperature carbonization of cannel, the results of which were recorded by the same Authors at the Institution Meeting in June of 1936, and it provides a comparison of the two systems of carbonization and of the properties of the corresponding products. The results show that carbonization under gas-making conditions compares favourably with low-temperature carbonization. The yield of gas by the latter process is much less, the yield of tar is lower and the tar is not greatly superior to the high-temperature cannel tar for the purpose of hydrogenation, and the combustibility of the low-temperature coke is only slightly higher. The comparison adds point to the desirability of a national assessment of the quantities of cannel available which are suitable for gas-making purposes.

The Reports of the Joint Research Committee of the Institution and Leeds University which are to be presented are indicative of the change of outlook regarding the most useful lines which research and investigation of the type should take. The subjects with which these Reports deal are of fundamental importance. One concerns the combustion characteristics of town gas, the aim of which research is to lead eventually to the simplification in design of appliances for use in the Industry, the evolution of burners possessing the widest range of service, and to arrive at information to indicate to the manufacturing side the type of gas desirable and the limits of variation allowable. The other deals with the investigation of the use of oxygen and high pressure in gasification, being the second Report of the study of a process which, if proved successful, would offer remarkable possibilities. As customary there will be the Reports of the Gas Education, Research Executive, Liquor Effluents and Ammonia, and Refractory Materials Committees, and the Pipes Committee will submit their first Report.

In addition to the Paper by Dr. King and Mr. Jamieson there are to be four " individual " Communications, inclusion of which in the proceedings of the Autumn Meeting has met with warm welcome. One of these Communications comprises three Papers on the removal of sulphur compounds from gas—by Mr. H. Hollings, Mr. W. K. Hutchison, and Dr. R. H. Griffith. The purging of gasholders by means of inert gas is the subject of a Communication by Mr. F. M. Birks; retort house and exhauster governing is to be considered by Mr. G. Dougill, and the ignition of gas by cold catalyst—a matter to which much attention has been paid during the past twelve months—by Messrs. L. W. Andrew, A. B. Densham, and E. W. Voice. The programme of the coming Research Meeting, it will be seen, is a very full one and a varied one. Everything points to two strenuous days of fruitful discussion covering questions of immediate public concern.

Gastronomics

MUCH time has elapsed since people first became familiar with the jibe at the housewife who "learned to cook with a tin-opener," and it has to be confessed that in the interval enormous advances have been made in the art and science of canning. But, apart from this consideration, it may be thought that the remark still retains some of its old sting. It is quite rightly urged that the food canning industry has rendered practicable variations in diet, and the enjoyment by an ever-widening circle of consumers of very many table luxuries that were far beyond the bounds of possibility in years gone by; and now, in order that the up-to-date housewife may take full advantage of the opportunities thus placed within her reach, there has been set up in the West End of London a Food Canning Advisory Bureau, complete with a labour-saving kitchen.

It is understood that the services of this new Bureau are free, and that, in addition to demonstrations of the preparation and serving of good and attractive meals, applicants will be able to secure advice and information on the subject of canned foods. There can be no doubt that this move will result in still further popularity for the goods which the 200 factories in Great Britain where food is canned have been designed to supply in astounding variety. No one will be more ready than ourselves to concede to the canning industry its "place in the sun," but in saying this we would add the hope that its undoubted usefulness will not be abused. The efficient housewife must continue to do much more than "learn to cook with a tin-opener," and the Gas Industry, so far from relaxing in its zeal, must redouble its efforts to keep her well informed of the convenience and labour saving of the gas cooker.

By all means allow the housewife and her family to enjoy the good things that the canning industry has to offer—and they are legion (including, we understand, more than forty brands of canned beer)—but make certain that she does not permit herself to neglect the easy way to health and happiness that is provided by her unfailing friend the gas cooker. Each hour brings along its own batch of potential and *de facto* housewives, whose education in the duties of what is, after motherhood itself, the most important work in life, must not for an instant be neglected. The Gas Industry has a great responsibility in this respect; let it see to it that it does not fail. The opportunity is present; the means are at hand. Is the fullest possible advantage being taken of each? This is a question which no gas executive can afford to ignore, if he has at heart, in the first place the welfare of the nation at large, and in the second place the prosperity of his own particular Industry.

Strange as it may seem, even to-day one comes across people who are unfamiliar with the possibilities of a gas cooker. Perhaps it must be always so, but make positively sure that it does not occur through any fault of the Gas Industry. Demonstrations and explanations—never forgetting the more simple operations and statements—must be the order of the day. The present and the future housewife must be sought on the highways and in the byways, and compelled to come in to listen.

Personal

Mr. H. H. BROWN, of Sleaford, Lincs., has been appointed a Director of the Sleaford Gas Company.

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Mr. FREDERICK COLIN FRANKS, who recently retired after 58 years' service with Messrs. C. & W. Walker, Ltd., gas plant manufacturers and engineers, was last week presented with a pair of binoculars and a wallet of Treasury notes by Mr. R. J. Milbourne (Managing Director).

Mr. Milbourne said Mr. Franks was a man of outstanding character and ability, who had always done his best in the interests of the firm and earned the respect of all who worked under him. He wished him a long and happy retirement.

In reply, Mr. Franks, who served 28 years as Manager, thanked all who had associated themselves with the gift.

He has been treasurer of the C. W. Walker, Ltd., Charities Committee for the past 28 years, and has disbursed £3,420 to various hospitals.

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Mr. THOMAS SAWYERS, Distribution Superintendent to the Perth Gas Department, has been appointed Assistant Manager of Perth Gas Department.

Obituary

His many friends in the Gas Industry will learn with deep regret of the sudden death of Mr. DAVID VASS, who retired from the position of Engineer and Manager of the Perth Corporation Gas Department only a few months ago, after having been in the Industry for 60 years.

Mr. Vass received his early training in gas engineering under the late Samuel Stewart, then Engineer and Manager of the Greenock Corporation Gas Department. He was appointed Manager and Secretary to the Portobello Gas Light Company in 1887, and, ten years later—on the acquisition of that Undertaking by the Edinburgh Corporation—he was transferred to the staff of the Edinburgh and Leith Gas Commissioners. Three years later he was appointed Engineer and Manager to the Airdrie Gas Light Company, and during his term there the Undertaking was taken over by the local Town Council. In 1912 he was appointed Engineer and Manager at Perth. Mr. Vass was President of the Waverley Association of Gas Managers in 1895 and again in 1930, of the informal meeting of Scottish Gas Managers in 1909 and 1910, and of the North British Association of Gas Managers in 1914. He was also an honorary member of both sections of the Scottish Junior Gas Association.

Mr. Vass took a wide interest in all gas matters, and was associated with many of the smaller works near Perth, having visited one of these only a few days prior to his death. Sympathy will be extended to Mrs. Vass in her sad loss.

Forthcoming Engagements

Oct.

21.—MIDLAND JUNIORS.—Meeting and Paper by F. J. Bengough on "Purging of Water-Sealed Gasholders."
22.—I.G.E.—Technical Sub-Committee of the Joint Lighting Committee, 2.30 p.m.
23.—SCOTTISH WESTERN JUNIORS.—Visit to Paisley Gas-Works.
23.—LONDON AND SOUTHERN JUNIORS.—Visit to Wandsworth Works of Vacuum Oil Company.
25.—LONDON AND COUNTIES COKE ASSOCIATION.—Executive Committee, 11 a.m., and Central Committee, 12 noon, at Gas Industry House. Luncheon, 1.15 p.m., and Annual General Meeting, 3 p.m., at the Mayfair Hotel, Berkeley Street.
26.—B.C.G.A.—Eastern District Conference at Lincoln.
26.—GAS COMPANIES' PROTECTION ASSOCIATION.—Committee Meeting at 5, Victoria Street, S.W. 1, 2.30 p.m.
27.—B.C.G.A.—Northern District Conference at Darlington.
28.—COKE OVEN MANAGERS' ASSOCIATION.—Annual Dinner, Hotel Victoria, London.

Nov.

2.—I.G.E.—Council, 9.30 a.m.; Council (*continued*), 4.30 p.m.
2 and 3.—I.G.E.—Autumn Research Meeting.
3.—BRITISH GAS FEDERATION.—Annual General Meeting and Dinner, Grosvenor House, Park Lane, W. 1.
4.—S.B.G.I.—Autumn Meeting, May Fair Hotel. Council, 11 a.m.

News in Brief

CURRENT EVENTS IN THE GAS INDUSTRY

To Meet the Cost of new carbonizing plant and the laying of gas mains the Largs Council is to borrow £22,660.

For a New Holder the Grangemouth Gas Commissioners have agreed to acquire the necessary ground. The holder is to have a capacity of 500,000 cu.ft.

A Manager is wanted for the Castletown Gas Light Company and the Castletown Water Works, Ltd. The successful applicant would be expected also to undertake the Secretarial duties of both Companies. Further details of the position will be found in our advertisement columns.

Applications Are Invited for the position of Assistant District Salesman for a Gas Undertaking in the East. The salary of the position, further particulars of which will be found in our advertisement columns, is equivalent to £450 per annum, rising by annual increments of £27 during the first agreement of five years, to £558 per annum.

Among the Objects of a Special Order for which the Spalding Council intend to apply to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934, is the acquisition of the Holbeach Gas and Coke Company, Ltd. (already announced in our "Amalgamation and Grouping" column), and the extension of the limits within which the Council are authorized to supply gas.

The Directors of the Newton Abbot and District Gas and Coke Company, Ltd., are offering 20,000 "B" ordinary shares of £1 each at 21s. per share, ranking for dividend *pari passu* with the "A" ordinary shares of £1 each after the "A" ordinary shares have received a fixed non-cumulative dividend at the rate of 2½% per annum. Further particulars of this offer will be found in our advertisement columns.

A Visit to Messrs. A. & E. Chapman's Laundry and a conference on Profit-sharing and Co-partnership at Chapman's Laundry, Portsmouth, has been arranged by the Industrial Co-partnership Association on Oct. 27. The chair at the conference will be occupied by Mr. Thomas Carmichael, M.Inst.C.E., Deputy Chairman and General Manager of the Portsmouth and Gosport Gas Company. Visitors will also hear an Address from Mr. Stanley J. Benham, head of the firm of Benham & Sons, Ltd.

A Very Successful Health Week was organized by the Middleton Gas Department from Oct. 4 to 9. The exhibition was opened on Monday, Oct. 4, by the Mayor of Middleton, supported by the Chairman of the Health Committee and members of the Town Council. The attendance during the week was 2,900, record entries were received for the cake-baking competitions, and great interest aroused in the town. The attractions included health talks by Mr. T. Bowen Partington, cookery demonstrations by Miss H. Tuxford, washing demonstrations by Miss M. Gill, of Messrs. W. H. Dean & Son, Ltd., and talks on kitchen planning by Mr. B. D. Copland, of the Kitchen Planning Centre. Two special features of the exhibition were a full-sized model kitchen built to the design of the Kitchen Planning Centre, and displays of health exercises by the members of the Women's League of Health and Beauty.

The Number of Exhibitors and buyers at the Great Engineering Fair and Building Fair easily broke all previous records at the Leipzig Fair of 1937, and yet signs are not wanting to justify the assumption that the extent of the 1938 Spring Fair which is to be held from March 6 to 14 will be still greater and more impressive on the score of both quantity and quality. The exhibition area in the majority of the halls was booked in advance to the last square foot as early as September, and with a view to meeting the wishes and requirements of the exhibiting industries the Management of the Leipzig Fair decided to erect two new commodious halls and make still another hall available for exhibition purposes, which has been serving other tasks in the past. The new halls to be placed in commission in due time for the Spring Fair of 1938 embrace approximately 193,000 sq.ft., and thus will increase the volume of exhibits at the next Engineering Fair by nearly one quarter.

A Reduction in the price of gas to 1s. 0½d. per therm has been agreed upon by the Lanark Town Council.

The Recommendation of the Hamilton Town Council Gas Committee that the old gasholder be demolished and a new one erected has been agreed to by the Council. The proposed holder will have a capacity of 500,000 cu.ft.

In Little More Than a Year from the extension of mains to Willingham, the Cambridge University and Town Gas Light Company have satisfaction in knowing that the majority of the villagers are now consumers. This fact, quoted by the Chairman, Mr. J. F. Cameron (Master of Caius College), was mentioned at the opening ceremony on Oct. 11 of a new gas showroom at Willingham, performed by Mr. G. W. Hart, Chairman of the Parish Council. Demonstrations of cooking and home laundering were given throughout the week, and in future the showroom will be open two afternoons a week for the inspection and sale of gas appliances. Later it is hoped to appoint a resident fitter. At a tea which followed the opening ceremony, Mr. Hart said that Willingham householders were perfectly satisfied with the results of the policy of local gas lighting in the streets. He thought that people in the rural districts should be further educated in the domestic uses of gas. Mr. Guy Dale, a Director, and Mr. J. Hunter Rioch, Engineer and Manager of the Company, expressed thanks to Mr. Hart.

National Gas Council

Meeting of the Central Executive Board

A meeting of the Central Executive Board of the National Gas Council was held at Gas Industry House on Tuesday, Oct. 12—Sir DAVID MILNE-WATSON, Bart., LL.D., D.L., in the Chair.

The late J. H. Sillitoe.—Before proceeding with the business of the meeting, the Chairman referred to the loss sustained by the death of Mr. J. H. Sillitoe, who had been Secretary of the Manchester District Executive Board since its inception in 1919, and Secretary of the other National Committees in that district. His services had been of great value not only to the Manchester District but to the whole of the National Organizations. His death at such an early age was greatly deplored. A vote of sympathy to his family was passed, all the members standing in silence.

Many important matters were discussed, but reference can only be made to the following—viz.:

Coal.—A Report which had been circulated to the members of the Board, with regard to the meeting of the Coal Committee of the Conjoint Conference of Public Utility Associations with Captain Crookshank, M.P., Secretary for Mines, on Sept. 30, was discussed.

Codification and Amendment of Highway Law.—It was reported that the Government were appointing a Committee to codify and to amend Highway Law. The Terms of Reference to the Committee were "To examine the existing law relating to highways, streets, and bridges in England and Wales, and to prepare one or more Bills codifying the law, with such amendments as may be desirable to secure simplicity, uniformity, and conciseness." It would therefore be seen that the Bills in question were to be, in effect, Consolidation Bills only, the amendments being solely directed to simplicity and uniformity.

Annual Meeting.—The date of the next Annual General Meeting of the Council was fixed for Tuesday, May 10, 1938, the Society of British Gas Industries holding its Annual General Meeting and Dinner on the following day.

Joint Gas Conference Committee.—The following representatives were re-appointed to serve on the Joint Gas Conference Committee on behalf of the Council: Mr. P. N. Langford, Mr. H. C. Smith, and Mr. W. W. Townsend.

It was stated that the Joint Gas Conference would take place at the British Industries Fair, Birmingham, on March 1, 2, and 3, 1938.

Low-Temperature Carbonization of Scottish Cannel

I.G.E. Communication No. 162

In last week's "JOURNAL" we published Communication No. 162 of The Institution of Gas Engineers—a Paper on "The Low-Temperature Carbonization of Scottish Cannel" by J. G. King, Ph.D., B.Sc., F.I.C., and James Jamieson, M.Inst.Gas E. Copies of this Communication can be obtained from the Secretary of the Institution, 1, Grosvenor Place, London, S.W. 1, price 1s. 6d. each, post free.

A Convalescent Home for Workmen

Gas Light and Coke Company's Welfare Development

Workmen of the Gas Light and Coke Company recovering from illness will now be able to recuperate by the sea, for a convalescent home is to be opened for them at Ramsgate by the Mayor, Alderman H. Stead. The home stands in its own grounds facing a public garden and has a recreation room with darts boards and similar indoor games.

This is the latest development in the Company's scheme of social welfare. The home will be under the control of the Hospital and Benefit Society and managed by a fully qualified matron. The Society now has 24,000 members and during the past nine months 4,000 applications for benefit have been received and 3,000 grants made towards the cost of treatment.

George Wilson Gas Meters, Ltd.

First Report as a Public Company

On Feb. 16 last London Industrial Finance Trust made an offer for sale of 100,000 5½% Cumulative Preference Shares of 10s. each at par and 100,000 Ordinary Shares of 4s. at 9s. per share.

Profits to June 30, 1936, were then disclosed as amounting to £17,404, as compared with £22,739 for the year ended June 30, 1937, shown by the accounts recently issued. Of this sum £12,666 was earned prior to the incorporation of the Company, and is distributable to the liquidator of the Vendor Company. £3,200 is required to cover the estimated liability of the Company for income-tax and national defence contribution, so that a sum of £6,873 is available for distribution.

Dividend requirements for the preference shareholders absorb £751, leaving a balance of £6,122. Of this sum the Directors recommend that £3,750, or a dividend of 10%, should be distributed, leaving £2,372 to be carried forward. Cash at bank and in hand amounts to over £10,000. Debtors come to over £30,000, and sundry creditors are £23,581.

These figures would appear to indicate a very sound position, and ordinary shareholders, taking stock of their prospects, will note with interest that future profits will not be liable to the deduction of £12,600 which has this year gone to the liquidator of the Vendor Company.

The South-Western Gas and Water Corporation, Ltd.

Close Brothers, Ltd., Secretaries, announce that the Directors of the South-Western Gas and Water Corporation, Ltd., have declared an interim dividend of 2% (actual) less income-tax, payable on Nov. 19.

United Kingdom Gas Corporation, Ltd.

Close Brothers, Ltd., Secretaries, give notice that an Extraordinary General Meeting will be held at 9, Clements Lane, E.C. 4, on Nov. 4, for the purpose of considering, and if thought fit passing, Special Resolutions.

The chief of these proposes that the Capital of the Company be increased to £6,000,000 by the creation of 500,000 4½% First Cumulative Preference Shares of £1 each, 500,000 4% First Redeemable Cumulative Preference Shares of £1 each, and 1,000,000 Ordinary Shares of £1 each.

It is pointed out that the acquisition by the Corporation of various gas undertakings during 1937 has considerably reduced the available unissued share capital. It therefore becomes necessary to increase the Corporation's authorized capital again, in order that further shares may be issued as and when required.

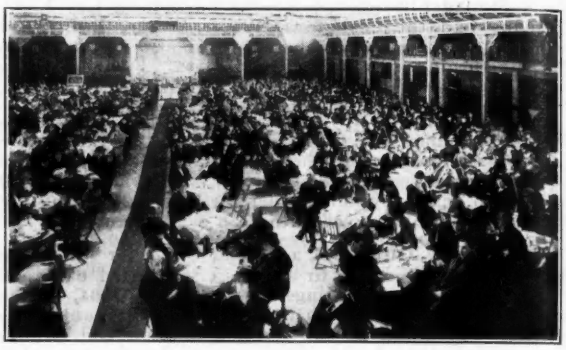
Birmingham Women's Gas Circle

Membership Almost Reaches Four Figures

The Third Annual Tea of the Birmingham Women's Gas Circle was held on Oct. 7 at the Palais de Danse, when nearly 700 members were present. This is the largest assembly under the auspices of the Circle since its inception in 1932, and necessitated more accommodation than could be provided where the tea was formerly held.

Alderman T. O. Williams presided, and was supported by members of the Gas Committee.

During the past twelve months the paying membership has grown from 633 to 960. Not only is this increase gratifying, but it is evident in many ways that the members of the Circle are taking keener interest and pride in its activities.



The Annual Tea is made the occasion for a Baking Competition, and 304 cakes (Madeira and Shortbread) were submitted. These were on view at the Palais de Danse, and the tables were surrounded by members before and after the proceedings. A new feature this year was the inclusion in the competition of a section for relatives of the Department's employees who are members of the Circle. The cakes submitted for the competition were sent to two of the City Hospitals.

Prizes ranging from gas sink water heaters to cooker lighters were awarded to the winners, these being presented by the Lady Mayoress. The function was also honoured by the presence of the Lord Mayor (Alderman H. Roberts).

Birmingham is very proud of its New Hospitals Centre now nearing completion, at an initial cost of one million pounds, and the Circle members were pleased to hear an interesting short talk on the Centre by Sir Charles Grant Robertson, Vice-Chancellor and Principal of Birmingham University and Chairman of the Executive Board of the New Hospitals Centre.

Miss Olive L. Humphries (Organizer of the Circle) appealed for the enthusiastic help of existing members to bring the membership to four figures this year, and in the few days which have elapsed since the request was made, the desired number has almost been reached.

Music was rendered during the afternoon by the Palais de Danse orchestra.

New B.S. Specification

Rotation of Machine Tool Handwheels

A new Specification, which has been recently issued by the British Standards Institution, defines the direction of rotation of machine tool handwheels and levers relative to the movement produced. The direction of rotation is to be judged from the operating position, or as seen from the outside of the machine looking in the direction of the axis of the operated member.

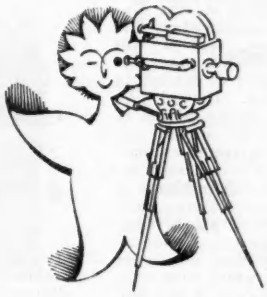
For screw operated machine members, clockwise rotation of the crank or handwheel in general moves the machine member affected towards the cutting position.

In rack and pinion mechanism, or the equivalent, where the crank or handwheel moves in a plane parallel to the movement produced, the general rule is that the part of the crank or handwheel which will normally be gripped by the operator moves in the same direction as the member of the machine affected.

The Specification includes in tabular form the description and movement of the movable part and the operating device for lathes and drilling, planing, milling, slotting, shaping, and grinding machines.

Copies of this new British Standard (No. 754-1937) may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W. 1, price 2s. 2d. post free.

Our Film Critic Reviews



The New GAS FILMS

Extensive Additions to the B.C.G.A. Service

THE British Commercial Gas Association and the Gas Light and Coke Company are to be warmly congratulated on the manner in which they continue to take their part in advancing the general welfare and knowledge of the nation by producing, and placing at the service of the gas undertakings of the country, a number of films comprising different aspects of social science. Yet another series of these had its London Premiere at the Piccadilly Theatre on Oct. 12, dealing in an interesting and instructive manner with such subjects as cooking, re-housing, kitchen planning, and educational policy.

With the release of the films, the B.C.G.A. have issued to members comprehensive literature describing the complete Film Publicity Service and giving many useful hints as to how the best use can be made of it, how audiences can be attracted, and what generally is the procedure for showing the films. It is interesting to note that the Association intends to appoint a Film Officer whose advice and assistance will be available to all members. Sound Services Limited, of Filmcity House, Upper St. Martin's Lane, W.C. 2, have again been appointed official distribution contractors. With the addition of the new film to the previously existing series, there are now available in all seventeen "gas" films, including "What the Chef Saw," which is included in the list by courtesy of Radiation Limited.

Our Film Critic comments as follows upon the films.

How to Cook.

THE keystone to domestic happiness surely lies in the kitchen, and unless the housewife knows how to manage her house, and in particular her kitchen—how, for instance, to use her gas cooker and various utensils in the most effective manner—it is to be feared that hers will not be a smoothly running household.

The value of such knowledge is revealed in a new Marcel Boulestin film. This wizard of the soup ladle, so well known already to gas film fans, again explains quite simply the best ways of cooking and how to keep the kitchen in good order. Bad food, he says, is usually conducive to indigestion; indigestion means bad temper, and therefore food must be good because it means the happiness of the individual and so, automatically, the health of the nation. Even the housewife who has to admit that cooking is not her forte (and who has, therefore, in her husband's estimation, probably married him under false pretences), after watching M. Boulestin's methods and inhaling, in imagination, the succulent aroma which seems to pervade the atmosphere, so realistic was the cooking, will probably resolve to go home and try again.

Daisy Bell Comes to Town.

I FELT rather sorry she had. She was surely easily satisfied if, after worrying herself sick with doubts as to her usefulness to society, she returned contentedly to graze for the rest of her days when she had learned that milk was the basis of two dishes, however tempting they might have been. Two is a limited repertoire. One would much prefer to see her in a university "rag" than a demonstration theatre. But, to leave this pantomime figure for a moment, what does the film set out to do? To demonstrate the nutritive value of milk or the excellence of gas cooking, or merely to be funny? As it stands it fails to demonstrate anything, except, perhaps, some very clever co-operation between the man playing head and front legs and the man playing the complementary rôle of the cow. On the score of its humour let it merely be stated that this film was seen *before* dinner.

Kensal House.

THIS is a review by the tenants and others of the difference between life in the slums and in the remarkable new model housing estate at Kensal Green. The film portrays one of the greatest problems of our time—that of rehousing people from slum areas. Appalling conditions are revealed as prevailing in so many of the "Black areas" to-day. Families crowded into the minimum of space, with no proper facilities for washing and cooking—some even forced to do their cooking on the landing and to carry their water up four flights of stairs. But, as the old adage says, there is a silver lining to every cloud, and the film proceeds to show what has proved to be a great start in the new order of things at Kensal House. Suffice it to say that this little community of happy and comfortably housed tenants bears witness of the success of what might be deemed a modern "Utopia" among the poor. Emphasis might, perhaps, have been laid on the fact that there is still a great deal to be done to improve conditions among the poor, but it is gratifying to note that the Gas Industry is playing an important part in setting things right.

Pots and Plans.

THIS is the first British film on Kitchen Planning. A badly planned kitchen is the cause of much unnecessary fatigue, annoyance, and even danger, and the housewife who is able to see this film will be surprised to note how much trouble she can save herself by planning her kitchen in such a manner as to have near at hand the utensils most frequently needed. The kitchen on the screen, in which things are by no means running smoothly, is magically transformed, merely by altering the positions of various equipment, into one in which the housewife is able to go about her work in a far more efficient manner. The suggestions contained in this film will, no doubt, be of much service in demonstrating how the kitchen, by wise planning and arrangement, can be made more pleasant and convenient to work in.

The Smoke Menace.

THIS is both striking and convincing and points the moral that smoke abatement is practicable and, far from involving the owner of the offending chimney in financial loss, can represent an appreciable gain. There is some superb photography in the film and the variety of "shots" for a specialized film of this nature is pleasantly surprising. The film records a gradually changing opinion from "where there's muck there's money" to "where there's muck, there's waste," and seeks to arouse the public conscience by a demonstration of the ravages of smoke on our national buildings. Speaking in the course of the film, Professor J. B. S. Haldane confesses himself to be a public enemy inasmuch as he lives in a house heated by several open coal grates, but at least he does realize that he should be ashamed of himself for his chimney is co-operating with a million others to make London not merely dirtier but less healthy. Combating the well known evils of smoke are shown the reforming processes which turn coal into its modern forms—viz., hydrogenation, low-temperature carbonization, electrical generation, and, of course, the Gas Industry, which strikes at the root of the problem by treating over 17 million tons of coal a year. The great work the Industry is doing in the field of smoke abatement both domestically and industrially is clearly shown. But it is equally apparent from the film that there still remains to

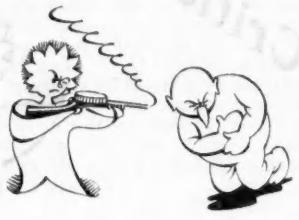
be carried out a task of gigantic proportions. People who are fighting the menace all over the country realize, more and more as positive results are achieved, that only the fringe of the problem has so far been touched. Unless there is to be a more general reform, in another five years the new buildings of slum clearance schemes will be dirty as the old ones around them.

Children at School.

THIS is described as the Gas Industry's documentary film of the year, and it will worthily take its place beside last year's Nutrition Film, so much discussed as dealing in novel manner with a subject of national interest. Devoid, like its predecessor, of gas propaganda of any kind, it is a review of the public education system of this country, and its interest lies in showing the great work being done to give the young citizens of to-morrow a good start in life. The schools being built to-day, with their large sunlit rooms, their improved methods of teaching, their facilities for games and physical training, and their arrangements for serving meals, are, as shown in the film, being planned on the right lines. However, there is a gloomy side to the picture—the thousands of children who are being taught under impossible conditions, and it is evident that very many more new schools are needed. The producers of the film have shown that this is a very real need in their comprehensive survey of this great social problem. A particular feature in the film is the splendid photography, many of the delightful child studies being worthy of special note.

Two Frightened Ladies.

THIS comedy film prompts a fanciful flight to an announcement from the leader of a famous dance orchestra that his next number would be that popular fox-trot "Meet Mr. Therm." For such is the finale of the film, and both the tune and the words—two essentials of a popular favourite—are "catching." Something akin to Gilbert and Sullivan opens this film with the solicitor singing a rhymed will to the two spinster daughters of the deceased, who inherit his house. Their joy at their apparent good fortune, however, is short lived, for they find their new home is "possessed" by the bogey "Discomfort," whose lack of anything in the nature of likeable attributes defies comprehension. One feels Epstein might be a trifle professionally jealous of "Discomfort's" creator. Confronted with the incarnation of "Discomfort," the dear old things cry out for help, and are instantly succoured by the genial Mr. Therm, who effectively destroys "Discomfort" and exorcises his evil influence from the house with gas appliances.



Institution of Gas Engineers

Public Works, Roads, and Transport Congress and Exhibition

The 9th Public Works, Roads, and Transport Congress and Exhibition will be held at the Royal Agricultural Hall, Islington, London, N. 1, from Nov. 15-20.

Members of The Institution of Gas Engineers may apply to the Secretary of the Institution for Season Tickets for the Congress and Exhibition and they are particularly invited to attend the Institution's Session—at which the Chair will be taken by the President, Mr. H. C. Smith, on Tuesday, Nov. 16, at 3 p.m., when the following Papers will be presented and discussed:

"Gas for Commercial and Industrial Uses," by H. R. Hems (Superintendent, Industrial Heating Section, City of Birmingham Gas Department).

"Modern Road Tars," by W. J. Hadfield, C.B.E.

Members desiring to register as Delegates to the Congress and Exhibition—the Registration Fee of one guinea for which includes an advance copy of all Papers to be presented and a bound copy of the Congress Proceedings—should communicate with the Secretary of the Congress (Sir Sidney Johnson), at 84, Eccleston Square, London, S.W. 1.

Copies of the above-mentioned Papers by Mr. Hems and Mr. Hadfield may be obtained, price 1s. each, including postage, from the Secretary of The Institution of Gas Engineers at 1, Grosvenor Place, London, S.W. 1.

Communications at Autumn Research Meeting

The Ninth Autumn Research Meeting of The Institution of Gas Engineers will be held on Tuesday and Wednesday, Nov. 2 and 3, at the Institution of Mechanical Engineers.

The following Communications will be presented and, with the exception of Publication No. 162, discussed:

14th Report of the Gas Education Committee; 1936-37. (*Communication No.* 164.)

3rd Report of the Research Executive Committee; 1936-37. (*Communication No.* 165.)

40th Report of the Joint Research Committee of the Institution and Leeds University. Combustion Characteristics of Town Gas—Part I. Review of Literature—Part II. Examination of Aeration Test Burner. (*Communication No.* 166.)

41st Report of the Joint Research Committee of the Institution and Leeds University. The Investigation of the Use of Oxygen and High-Pressure in Gasification—Part II. Synthesis of Gaseous Hydrocarbons at High Pressure. (*Communication No.* 167.)

7th Report of the Liquor Effluents and Ammonia Committee. (*Communication No.* 168.)

28th Report of the Refractory Materials Joint Committee. (*Communication No.* 169.)

1st Report of the Pipes Committee. (*Communication No.* 170.)

4th Report of the Gasholder Committee. (*Communication No.* 171.)

Purging Gasholders by Means of Inert Gas, by F. M. Birks, O.B.E., M.Inst.Gas E. (*Communication No.* 172.)

Retort House and Exhauster Governing on Gas-Works, by G. Dougill, M.Sc., Assoc.M.Inst.Gas E. (*Communication No.* 173.)

Ignition of Gas by Cold Catalyst, by L. W. Andrew, B.A., B.Sc., A. B. Densham, M.A., and E. W. Voice. (*Communication No.* 174.)

Removal of Sulphur Compounds from Gas. Papers by (i.) H. Hollings, M.Sc., M.Inst.Gas E., (ii.) W. K. Hutchison, B.A., (iii.) R. H. Griffith, D.Phil. (*Communication No.* 175.)

The Low-Temperature Carbonization of Scottish Cannel, by J. G. King, Ph.D., B.Sc., F.I.C., and James Jamieson, M.Inst.Gas E. (*Publication No.* 162. Price 1s. 6d., already published.)

A Bouquet for Kidderminster

Mayor on Lighting at Ten Days' Exhibition

There has just concluded at Kidderminster a highly successful exhibition which was held at the Town Hall and Corn Exchange. The exhibition which was organized by the Kidderminster Gas Company was opened on Oct. 5 by the Mayor, Councillor E. G. Eddy. Mr. G. S. Tomkinson, Director, presided in the absence of the Chairman, Sir Sydney Lea, Bart., and was supported by three other Directors, Colonel J. R. Goodwin, V.D., Mr. G. P. Lea, and Mr. John E. Talbot. In his opening remarks the Chairman mentioned the progress of the Company. He had been informed by their Engineer, Manager, and Secretary, Mr. Percy Dougall, that during the first six months of this year the sale of cookers and other appliances had increased enormously and during the same period the sale of cookers on hire-purchase had increased by 100% compared with the corresponding period of last year.

Opening the exhibition, the Mayor reminded those present of the progress of the Gas Industry. He also paid a sincere tribute to the Kidderminster Company when he observed that the town was well served by it. The Company was go-ahead and thorough, and the streets of the town were better lighted than they had been for many years. Colonel Goodwin, proposing a vote of thanks to the Mayor, recalled that he himself had been a Director of the Company for forty-six years and his family had been connected with the Company for forty years previous to that. Mr. Dougall then announced the attractive programme that had been drawn up for the ten days for which the exhibition would run.

In the afternoon and evening of each day, demonstrations were given by Miss L. V. Goldsworthy, of the Radiation Research Kitchen. Other firms who co-operated in this successful exhibition were the Ascot Gas Water Heater Company, Messrs. R. & A. Main, Ltd., Cannon Iron Foundries, Ltd., the Economic Gas Boiler Company, Ltd.

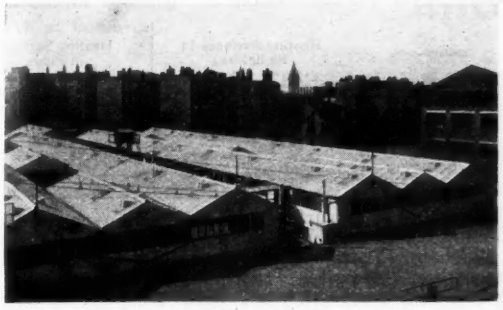
Ciné films were shown daily and washing machine demonstrations were given by Miss A. Greenhalgh, of the Economic Boiler Company. Another popular feature of the exhibition was cake-baking competitions for girls and adults.

The Central Heating of the

Gas Light & Coke Company's

Temporary Headquarters

An interesting central heating job has been carried out by Thomas Potterton (Heating Engineers), Ltd., in connection with the temporary headquarters of the Gas Light and Coke Company during the rebuilding of their Horseferry Road Offices.



A General View of the Temporary Quarters.

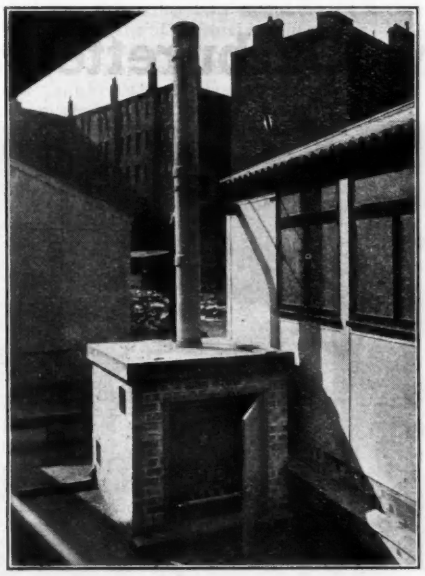
After 125 years' existence as the Headquarters of the world's largest gas undertaking, the Horseferry Road premises of the Gas Light and Coke Company have been deemed no longer adequate to cope satisfactorily with the ever-expanding business of the Company and at the same time out of keeping with the Industry's conception of up-to-date service. Whether or not the modernization of Horseferry Road itself had any bearing on the decision to re-build the gas offices we cannot say; but we have no doubt that the new premises will conform to the standards of the newly widened roadway and the imposing block of buildings on the opposite side.

Be that as it may, the Head Office staff of the Gas Light and Coke Company have been summarily ejected, lock, stock, and barrel, from Horseferry Road, and alternative accommodation has had to be found for all the Staff with the least disturbance of routine.

An available site in Vincent Street, quite close to the old building, has been utilized, to accommodate 500 people, and, as one of the accompanying photographs shows, this now presents an appearance not unlike a series of army huts, though we are assured—and, indeed, we have seen for ourselves—that the accommodation is superior to the military counterpart. The interior is everywhere light and airy, with plenty of window space and a cheerful decoration scheme of yellow panelling offset by green-painted beams. There are five of these huts, interconnected by covered corridors, the whole premises covering an area of 38,472 sq.ft.

By reason of the preponderance of outside walls, the problem of adequately heating the temporary quarters had to be tackled seriously; and the solution provides yet another example of the pre-eminence of gas for all kinds of central heating jobs. The matter was entrusted to Thomas Potterton (Heating Engineers), Ltd., of Balham, and a very interesting installation has been fitted up, which we have no doubt will satisfactorily stand the test of the colder weather yet to come.

A total interior capacity of 384,720 cu.ft. had to be dealt with, including large and small general offices, private rooms for various officials, corridors, and ladies' and gentlemen's cloak-rooms in each building. The installation is divided into four separate sections, an accelerated low-pressure system being employed. The gas boilers are fitted in brick enclosures outside the buildings, vertical flues venting the products of combustion at the level of the roof apex. These flues, in conformity with the practice lately adopted in a number of Potterton central heating installations, are not connected directly to the boilers, but vent from the top of the enclosures themselves. The latter are provided with air-bricks in the walls and give the effect of "balanced" flue conditions. The flow pipes enter the buildings just below the eaves, the circulation being assisted



One of the Potterton No. 2 Series "Rex" Boilers of 360,000 B.Th.U. per hour installed in its brick enclosure. The flow pipe can be seen entering the building behind the flue.

These two photographs show the arrangement of the heating surfaces in typical rooms. On the left the ceiling coil is supplemented by a wall radiator, while in the larger office on the right there are twin overhead pipes supplemented by double or triple returns below the windows.

by small electric pumps which are switched on at 7 o'clock each morning and kept running for a few hours until the buildings are nicely warmed up. The boilers are governed by remote-controlled air thermostats in the offices, in conjunction with immersion type thermostats in the heaters.

Overhead pipes run in duplicate the whole length of the larger offices, with drops to a further series of pipes beneath the windows. Similar pipes are provided in the smaller offices and cloak-rooms, while the officials' private rooms are fitted with wall type radiators varying in capacity according to the size of the rooms. The return pipes run back below the windows or along the corridors, and a particular feature of the installation is that practically every available square inch of heating surface is usefully employed, there being only a few feet of lagged piping outside the buildings in each instance.

Huts A, B, and D are each heated by a No. 2 series "Rex" boiler, in five sections, of 360,000 B.Th.U. per hour capacity, while huts C and E are jointly served by a single unit of 500,000 B.Th.U. per hour capacity.

The systems as a whole are calculated to give a temperature rise of 35° F., allowing for two air changes per hour, except in the main office where there is a large assembly of staff; here the system provides for a temperature rise of 30° F., but likewise with two air changes per hour. The following table shows the respective heating surfaces in the various sections:

Section.	Heating Surfaces in Radiators.	Heating Surfaces in Pipes.
	Sq.Ft.	Sq.Ft.
A	632	992
B	274	1,306
D	..	1,300
C	..	1,300
E	453	785

The total heating surfaces are therefore over 7,000 sq.ft.

The hot water supply for the cloakrooms was also carried out by Thomas Potterton, Ltd., each cloak-room being provided with an "Equater" thermal storage set which serves about nine basins.

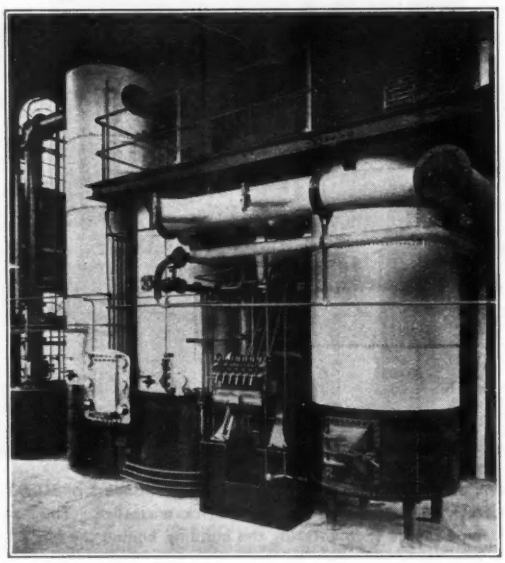
These temporary premises will be occupied for about two years while the Horseferry Road offices are being re-built.

New Carburetted Water Gas Plant

FOR

Lytham St. Annes

There was inaugurated at Lytham St. Annes gas-works on Tuesday, Oct. 19, a new automatically-operated carburetted water gas plant having a guaranteed daily capacity of 750,000 cu.ft. of 500 B.Th.U. gas. It is of a new design recently introduced by Messrs. Humphreys & Glasgow, Ltd., for medium sized gas undertakings, and incorporates a number of interesting features.



The plant is housed in a steel frame brick-panelled building and comprises a water gas generator, a carburettor and superheater in which the enriching oil gas is produced, a washer which effects the primary cooling of the gas and provides an hydraulic safety seal between the generating plant and the relief gasholder, a vertical high-duty multi-tubular water-cooled condenser, and a tar separator.

There are two sections of blowing plant. The larger section comprises an A.C. electric motor direct coupled to an H. & G. centrifugal blower, and the smaller auxiliary section, comprising a small fan type blower driven by a high speed Sisson steam engine, is provided for use when small quantities of blue water gas are required for diluting purposes.

As with all recent Humphreys & Glasgow installations, the plant incorporates their three-phase cycle back-run process.

The automatic operating system is of the mechanical type. All the working valves are positively controlled by the automatic operator, which is conveniently located at ground floor level, and the regulators, valves, and gauges, &c., are centralized alongside the automatic operator. This arrangement is particularly advantageous with plant of this type which, since the generator requires charging only at infrequent intervals, does not necessitate the full-time services of the attendant.

The automatic operator is driven through suitable reduction gearing by a small vertical steam engine, which provides all the power necessary for the operation of the various working valves. Hand levers are provided for use when raising heats, and these are also available in the unlikely event of the steam engine being out of commission. The timing of the automatic movements of the valves to suit any particular fuel or manufacturing condition is readily adjusted by altering the positions of the cams in the automatic operator.

The plant incorporates a safety system of valve interlocking gear, which positively prevents the movements of the valves whether automatically or manually operated, in an unsafe or incorrect sequence, and, if any irregularity should occur, the attendant is warned immediately by visible and audible signals. An electric bell is sounded when the generator requires to be charged. The plant is, therefore, virtually fool-proof.

A particularly interesting feature of the plant is the automatically controlled secondary combustion which correctly proportions the supply of secondary air to the varying combustible content of the blast gases leaving the generator. This facilitates the maintenance of the most suitable temperatures in the fixing vessels and effects a marked saving in generator fuel consumption.

Coke for the generator is delivered by a skip which is filled at high level by a special chute from the works coke storage hopper. For the transport of the skip a slightly inclined concrete platform is provided, which forms also the roof of the blower house. The whole operation of charging requires only a few moments.

Suitable provision is made for the future duplication of the plant, the blast main and gas connections being provided with the necessary branches.

The flexibility of the plant ranges from 8,000 cu.ft. per hour of 290 B.Th.U. blue water gas to 32,000 cu.ft. per hour of 500 B.Th.U. carburetted water gas, all on automatic operation.

Eastern Counties Gas Engineers' and Managers' Association

Autumn Meeting at Bedford.

The Autumn Meeting of the Eastern Counties' Gas Engineers' and Managers' Association was held on Oct. 14, 1937, at Bedford, under the Presidency of Mr. C. R. FOWLER, of Leiston.

By kind invitation of the Bedford District Gas Company, the meeting was held in the Company's Social Club, where light refreshments were served prior to the business.

Opening the meeting, the PRESIDENT extended a cordial welcome to Mr. R. J. Rogers (Chairman of the Society of British Gas Industries) and to all their other visitors.

The minutes of the previous meeting, as published in the Technical Press, were taken as read and unanimously agreed, after which the HON. SECRETARY AND TREASURER (Mr. W. C. Chapman, Boston) announced apologies for absence from officials of kindred organizations.

The PRESIDENT said that it was with deep regret that he had to refer to the loss which the Association had sustained in the death of Mr. R. Wardell, of Peterborough. He was an esteemed member of the Association, which he joined in 1911, and he always had its interests at heart. Floral tributes had been sent on behalf of the members, while representatives had attended the funeral. He also referred to the death of Mr. G. H. P. Perry, of Stourbridge, who had been an Associate Member since 1913. The Hon. Secretary had sent letters of sympathy in both instances. Those present stood for a moment in silent tribute to their memory.

Election of New Members.

On the proposition of Mr. B. CLARKE (Stamford), seconded by Mr. J. H. RIOCH (Cambridge), the following applicants for membership were duly elected—namely:

Associate Membership.—W. Harris (Manager, Burt, Boulton, & Haywood, Ltd.).

Membership.—R. Prince (Engineer, Manager, and Secretary, Peterborough Gas Company).

Institution Representative.

It was proposed by Mr. J. KENNINGTON (Grimsby), seconded by Mr. A. L. HIGHAM (Norwich), and unanimously agreed, that Mr. G. Wright (Lincoln) be asked to represent the Association on the Council of The Institution of Gas Engineers for another year, the PRESIDENT acknowledging their indebtedness to Mr. Wright for his continued services.

Mr. WRIGHT briefly returned thanks.

The New President.

The PRESIDENT went on to move the election of his successor in the chair. It was customary, he said, for the Vice-President to succeed to the chair, and Mr. W. C. Chapman had agreed to allow his name to go forward. Mr. Chapman was no stranger to them; he had worked with them and for them for many years. In fact, it was largely due to his energetic and untiring efforts that the Association was in the satisfactory state it was to-day. His training and experience had well fitted him to occupy the presidential chair, and Mr. Fowler felt sure he would fill that chair with distinction to himself and credit to the Association. He had been the guide, counsellor, and friend of seven past-presidents, who, together with the other members, could show no greater appreciation of Mr. Chapman's good work than by supporting his election as President of the Association.

Mr. G. WRIGHT, in seconding, endorsed all that the President had said. It needed no words of his, he remarked, to convince them that Mr. Chapman was a very fit and proper person to become their President. He had done years of yeoman service as their Hon. Secretary and Treasurer, and it was only right that he should now accept the highest office the Association could offer.

The resolution was carried with enthusiasm.

Mr. CHAPMAN, in acknowledging his election, said that he greatly appreciated the honour they had done him. He would endeavour to do all he possibly could to further the interests of the Association which it had been a pleasure to serve in the capacity of Hon. Secretary and Treasurer. In accepting the office of President he must necessarily retire from that of Secretary and Treasurer, and he did so with great regret, because that term of office had been a very pleasurable one. Throughout the whole period the Presidents under whom he had served had given him splendid support, as also had the members of the Committee and the Association generally. They had invariably helped him to make that office a success.

On the proposition of Mr. F. H. ROBINSON (Bishop's Stortford), seconded by Mr. C. E. WRIGHT (Ipswich), Mr. J. Kennington was unanimously elected Vice-President of the Association for the ensuing year; and Mr. KENNINGTON briefly acknowledged his appointment.

It was proposed by Mr. J. F. YOUNG (Grantham), seconded by Mr. S. HANDS (Sleaford), and unanimously agreed that the following two members be elected to fill the vacancies on the Committee—namely: Mr. W. H. Blundstone (Newark) and Mr. C. E. Grimwood (Sudbury).

The PRESIDENT welcomed the new members to the Committee and thanked the retiring members for the services they had rendered to the Association.

Re-election of Auditors.

The PRESIDENT observed that the Association was very well served by its officers, of whom none rendered more valuable services than their Auditors (Mr. G. A. Mallett, of Ipswich, and Mr. W. S. Venner, of Brentford). They had served for a great number of years, and they were very grateful for all they had done for the Association.

Thereafter, the Auditors were duly re-elected on the proposition of Mr. H. R. WIMHURST (Bury St. Edmunds), seconded by Mr. E. F. KEABLE (Gorleston).

The PRESIDENT went on to say that they had now reached another milestone in the annals of the Association. Mr. Chapman had been elected President, and he therefore had to relinquish the secretarial duties which he had so ably carried out for the past six years; and they all knew how efficiently he had carried out those duties. But only those members who had served on the Committee realized the tremendous amount of painstaking work which Mr. Chapman had devoted to his office—an office which called for a man of sterling qualities. The President expressed his personal gratitude to Mr. Chapman for the assistance he had rendered him during his own term of office. He had pleasure in moving a very hearty vote of thanks to Mr. Chapman for his valuable services.

This was seconded by Mr. B. CLARKE and carried unanimously, Mr. CHAPMAN briefly replying.

The New Secretary.

Mr. CHAPMAN went on to move that Mr. H. H. Redwood (Newmarket) be elected to succeed him in the office of Hon. Secretary and Treasurer. He thanked Mr. Redwood for agreeing to follow in his footsteps and assured him that at any time during his occupancy of that office he might rely upon him to give any help he could.

Seconding the proposition, Mr. C. B. STANIFORTH (Ely) remarked that Mr. Redwood was one of the promising young men in the Industry. While they regretted losing the services of an old friend they should appreciate that the holding of this office was an experience which should be given to as many as could receive it. They had been very well served by Mr. Chapman, and he was sure that Mr. Redwood would give them several more years of good service.

In acknowledging his appointment, Mr. REDWOOD said that he was happy to be of assistance to the Association. He had always admired Mr. Chapman's powers as Secretary, and after each meeting he had thought how little he envied the man who had to maintain the standards he had set.

Education Scheme.

Mr. A. GREGORY (Harwich) moved that Mr. E. F. Keable be re-elected Secretary of the district education scheme—an office which he had held since the inception of the scheme eight years ago. It involved a great deal of work,

and he would like to couple with the proposition a hearty vote of thanks to Mr. Keable for his past services.

This was seconded by Mr. J. GREEN (Wisbech), who remarked that it would be difficult to find a man to equal Mr. Keable in this education scheme work. In him they had the right man to encourage the younger members of the Industry.

Mr. KEABLE acknowledged this renewal of their confidence in him, remarking that it was a pleasure to him to handle the scheme. They all appreciated the difficulties which lay before the younger members of the Industry, and anything they could do to make their lives a little easier for them was a pleasure, and in that respect they were building up the Gas Industry of the future. He would continue to do all in his power to further the work of the education scheme.

The PRESIDENT announced that there had been no claims upon the President's Benevolent Fund during the year. He gratefully acknowledged a donation of five guineas from the Northern Commercial Section.

An Invitation to Boston.

Mr. CHAPMAN thereafter extended, on behalf of his Directors, a cordial invitation to the Association to hold its Spring Meeting at Boston.

The PRESIDENT said that they would look forward with much pleasure to the visit. It was 32 years since the Association last had a President from Boston, and there was no doubt that there had been considerable developments since then.

Mr. R. G. SHADBOLT, as a Director of the Boston Gas Light and Coke Company, supported Mr. Chapman's invitation. He and Mr. Chapman had been associated in their respective capacities for the past fifteen years or more. Speaking as a member of the Board of Directors, he said how delighted they were to know that Mr. Chapman was going into the chair of the Association and to know that, after this lapse of years, they would have the opportunity of entertaining the Association once again at Boston. He assured them that the Company would leave no stone unturned in making their visit enjoyable. As a member of the Association he would also like to support the President's acceptance of the invitation.

The PRESIDENT said they were very grateful to the Directors of the Boston Company for their invitation.

Mr. J. B. HANSFORD (Director, Engineer, and Manager of the Bedford District Gas Company) said he had great pleasure in welcoming the Association to Bedford. It was something like ten years since they were there last.

This concluded the business meeting, and thereafter the members had the opportunity of inspecting the Bedford gas-works, where a number of interesting extensions and renewals are taking place to meet the increased demand for gas.

Entertained at Luncheon.

At the kind invitation of the Le Bas Tube Company, Ltd., whose works the Association was to visit during the afternoon, the members were entertained at luncheon at the Swan Hotel, Bedford—Mr. R. OSBORNE (Managing Director of the Le Bas Tube Company, Ltd.) presiding.

The Loyal Toast having been duly honoured, Mr. OSBORNE welcomed the members and thanked them for honouring the firm with their company that day. He remarked that they used gas for a number of processes at the tube works, which he hoped would be of interest to them. He asked them to drink the health of their President.

The PRESIDENT expressed the Association's appreciation of the hospitality of the Le Bas Tube Company, Ltd., and referred to the high quality of their products, which was obtained by scientific control of all the manufacturing processes.

Mr. HANSFORD also voiced the thanks of the Association to the firm for the invitation to visit their works. The Le Bas Tube Company were the Bedford Gas Company's largest consumer, taking some 60 million cu.ft. of gas per annum, for which they paid 4½d. per therm.

Mr. W. F. WAKEFIELD (Director of the firm) then outlined the various manufacturing processes which the members were to inspect during the afternoon, referring particularly to the gas furnaces and other uses of gas at the works.

Called upon by the Chairman, Mr. R. J. ROGERS (Chairman of the S.B.G.I.), on behalf of all the members of the Society present, thanked the firm for their hospitality and for the invitation to look round their works. Whether they were manufacturers of plant or engineers of gas undertakings he was sure they would all enjoy the opportunity of seeing how these fittings were produced.

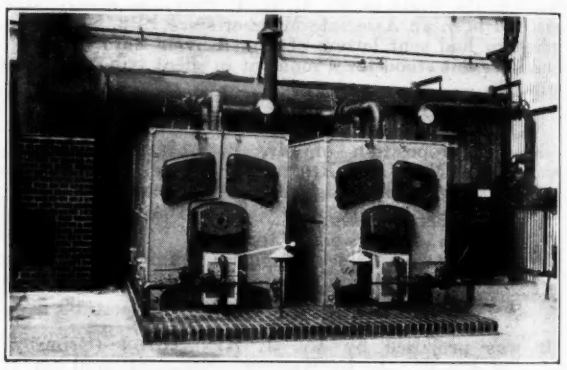
The members were then conveyed to the Le Bas Tube Company's works. Actually, the manufacturing side is carried out by the Britannia Iron and Steel Works, Ltd., the distribution being in the hands of the Le Bas Company.

The Manufacture of Malleable Iron Fittings.

For nearly thirty years the GF malleable iron fittings, manufactured by the George Fischer Iron and Steel Works, Schaffhausen, Switzerland, were imported into this country and marketed by the Le Bas Tube Company, Ltd. To-day they are manufactured in England, at Bedford, which has resulted in the Bedford Gas Company gaining an addition to its industrial load of some 60 million cu.ft. per annum. The most up-to-date plant has been installed, including several types of gas apparatus, and the firm employs more than 300 men and girls.

Malleable iron fittings take about three weeks to produce. The pig and scrap iron are melted down in cupolas, and the molten metal is run off into pots which travel the length of the foundry and moulding shops on overhead runways. It is then poured into hand ladles which is preheated by gas and tipped by hand into the moulds.

The first considerable use of gas takes place in connection with the sand cores, without which the fittings would be solid metal. These cores are made by hand or machines in core moulds and have to be dried before they can be used in the foundry. For this purpose a Keith-Blackman gas-fired core drying oven is used, which consumes up to 25,000 cu.ft. of gas per diem. This oven consists of an induced draught fan, firebrick-lined combustion chamber, gas burner, automatic safety device, and thermostat which controls the gas consumption through the diaphragm governor, according to the required working temperature of the oven. The hot air and products of combustion are delivered to the oven through ducts and return by way of



Part of the Gas-Fired Central Heating Plant at the Britannia Works, Bedford.

the fan to be re-circulated with newly heated products. The specially designed low-pressure burner will not light back, while the safety device, which works on the single diaphragm principle, cuts off the gas automatically should the supply fail, and then be turned on again.

When the fittings have been cast, the runners and gates are knocked off and the fittings packed into metal tumblers whose revolving action cleans up the castings. After inspection, they are ready for annealing.

Here gas again plays an important part. The castings are packed into annealing pots, together with small iron ore, mounted on trollies, and pushed into a large gas-fired oven of the tunnel or continuous type. This was installed by Gibbons Brothers, of Dudley, and has been in operation day and night without cessation since the end of 1933. It has a gas consumption of 100,000 cu.ft. per day. It takes two weeks for the castings to pass through this furnace, and the temperature varies throughout the length of the tunnel, being lowest at the inlet and outlet ends, and highest at the centre portion, or soaking zone. The furnace has sixty burners—thirty on either side, in staggered formation. In the instrument room it is possible to tell the temperature in any section of the furnace, while a continuous record is also kept.

After annealing, the fittings pass to the grinding shop, where any irregularities are removed. Gas is again used in a Lucas furnace in which the fittings are re-heated for rectification of any distortion which may have taken place during annealing. They also undergo a sizing process which ensures that all bores are standard and perfectly round. After a further process of "tumbling" to restore the fittings to a self-colour, they are passed to the unfinished stock room.

From here they are withdrawn to the machining room, where they undergo screwing, turning, tapping, and chamfering. They are then subjected to a pressure test

at 360 lb./sq.in. air pressure under water before passing to the final inspection department, where each individual fitting undergoes the last rigorous examination. Threads are all tested to N.P.L. limits.

For the galvanizing of fittings a gas-heated zinc bath is installed which consumes 18,000 cu.ft. per diem. There is also another gas furnace in use in the maintenance shop for tool hardening. Gas fired boilers are utilized in conjunction with air heaters for keeping the stock-rooms at an even temperature, while surface combustion heaters are used in a number of the shops.

Following the inspection of the works, the members were taken back to the Bedford Gas Company's Social Club for tea, when a cordial expression of thanks was offered by the PRESIDENT to Mr. Hansford and the Bedford Company for their hospitality. The Bedford Company, said Mr. Fowler, had the reputation for doing everything well, and their efforts had contributed very largely to the enjoyment of the day.

Mr. HANSFORD briefly acknowledged the vote, and expressed the hope that it would not be another nine years before the Association visited Bedford again.

Fusion Welded Pressure Vessels

by

J. H. N. THOMPSON, of Wolverhampton

A Paper presented to members of the Manchester District Association of Gas Engineers at the General Meeting held at the Midland Hotel, Manchester, on Friday, Oct. 15—the President (Mr. R. N. WEBB, of Leeds), occupying the Chair.

Electric welding of important pressure vessels was developed in the United States about ten years ago owing to a demand from the oil industry. Rivetted vessels had been largely used up to that time, but a number of fires had been caused by leaking rivets, and this method of construction was considered unsatisfactory. In addition, increasing pressures required vessels of a greater thickness than could be rivetted satisfactorily. Forged welded vessels were also limited in thickness and were discontinued

A Welded Autoclave Designed for a Working Pressure of 1,000 lb. per sq.in.

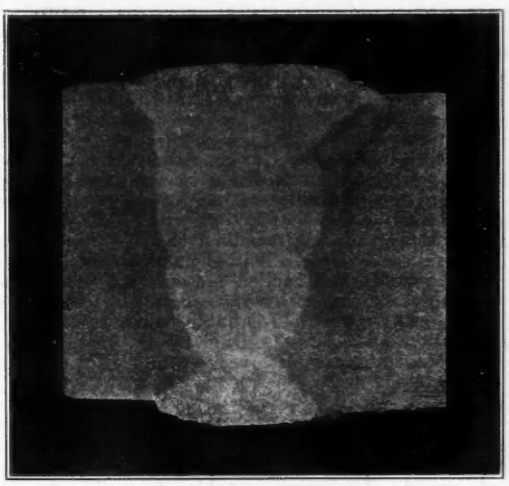
for this type of vessel in 1930. The high cost of solid forged vessels and the rapid obsolescence of oil plant also helped to create a market for the electrically welded vessels.

After considerable research it was found that electric welding could be developed to produce ductile welds of a high quality on thick plates, and one manufacturer carried out over thirty destructive tests on actual vessels. Subsequently, the Insurance Companies were satisfied with the process and in 1931 sufficient experience had been gained to formulate the A.S.M.E. Power Boiler Code, which laid down definite rules for the construction, testing, and inspection of welded pressure vessels. By this time X-rays had been developed for the examination of welded seams, and this non-destructive test was included in the Code.

From time to time the American Insurance Companies were asked to insure vessels made before any Code was in existence. These were mostly unfired pressure vessels such as heat exchangers, air receivers, and brine coolers for refrigeration plant, and would correspond to Class 2 vessels nowadays. Nothing was known of the quality of welding, and in some cases explosions took place after several years' operation.

To ascertain the quality of welding before insuring such a vessel, a plug 1¼ in. diameter is trepanned from the weld and this is polished and etched to disclose weld faults. Their experience has shown that several plugs taken from a vessel all show approximately the same quality of weld, and they consider this examination sufficient to decide whether the vessel is fit to continue working. A large number of these plugs have been examined and in some cases the metal was fused for little more than half the thickness of the joint. It was found that failures when they had occurred were due to incomplete side wall fusion, usually associated with trapped slag or oxide, and that a very inferior welding technique had been employed.

Until comparatively recently the welding of pressure vessels and boiler drums has been regarded with some suspicion in this country, and it is not surprising that engineers should be unwilling to trust a method of construction where hitherto the manufacturers have been unable to provide sufficient evidence of the quality of the work. With the introduction of X-rays, however, the quality of pressure vessel welding has made very rapid strides, and in 1934, Lloyd's Register of Shipping issued a specification for Fusion Welded Pressure Vessels and approved two British firms for the manufacture of Class 1 vessels which entails complete examination by X-rays. Subsequently Group Insurance Companies issued their specification. Since then several hundred Class 1 vessels, including boiler drums, have been constructed, and in America the figure for boiler drums alone is approaching



Macrograph of Weld.

5,000. The service record of these vessels is very satisfactory and no cases of failure have been recorded, which reflects considerable credit on those responsible for the various specifications and also on manufacturers and inspecting authorities. It is now generally admitted that

early failures in welded pressure vessels were due to lack of any code for construction and testing.

Meeting the Specifications.

In order to meet these specifications it is necessary for manufacturers to employ a technical staff specially trained in this subject and to equip a laboratory with chemical, physical, and X-ray apparatus so that works practice may be adequately controlled. At the same time, the best conditions for research are fulfilled.

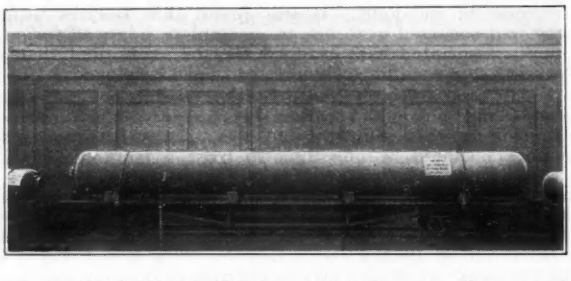
In addition to suitable welding equipment, the manufacturer requires heavy plate bending machinery and annealing furnaces capable of dealing with the sizes and thicknesses of the material involved.

Either acid or basic open-hearth steel with a tensile of 26-30 tons or 28-32 tons per sq.in. is most generally used, and a typical analysis is given below:

Carbon	0·1 to 0·25
Manganese	0·4 to 0·6
Silicon	less than 0·1
Sulphur	less than 0·05
Phosphorus	less than 0·05

In addition to mild carbon steels, low alloy higher strength materials can be satisfactorily welded and are becoming increasingly used in America, but so far they have not been used to any extent in this country.

The plates are planed so that on assembly an almost parallel-sided "U" is formed. This preparation has been found to be economical in weld metal and also tends to concentrate any lack of side wall fusion in the plane of the X-rays, so that even small faults are readily detected. The welding is carried out either by hand or by special automatic machines for feeding coated electrodes, and in both cases electrodes $\frac{1}{4}$ in. or $\frac{5}{8}$ in. core wire diameter are used at 325/400 amps. Each run of metal is continued from the seam on to a 2 ft. long test plate which is welded



A Fusion Welded Vessel, 60 ft. long by 6 ft. diameter. Constructed for a Working Pressure of 300 lb. per sq.in. Test Pressure, 600 lb. per sq in.

under identical conditions to the vessel. In a large boiler drum 30 ft. long, 5 ft. diameter, and $1\frac{3}{4}$ in. thick, over a quarter of a ton of weld metal would be deposited.

The electrode is of fundamental importance in producing a weld of the necessary quality, and should fulfil the following requirements:

(1) Deposit metal free from gas inclusions and with a chemical composition similar to the plate.
(2) Protect the weld from oxygen and nitrogen contamination during its passage through the arc when it is in a highly re-active condition.
(3) Produce a concave meniscus in the deposited metal so that the possibility of lack of side wall fusion is reduced.
(4) Be capable of withstanding the high contraction stresses on cooling. This is particularly important as the welding is carried out on material which is too thick to distort by any single run of metal and consequently the weld is liable to crack.
(5) Deposit ductile fine grain weld metal having mechanical properties very similar to the plate material.

Coated Electrodes.

Coated electrodes must be used to fulfil the very comprehensive series of tests which are made on the test plates of each vessel. The most suitable electrodes generally contain 5% to 10% of organic material incorporated in the mineral coating. This organic material increases the arc voltage, giving greater penetration, and also protects the weld metal from atmospheric contamination by forming a small zone of reducing gas round the arc.

After the longitudinal seams are welded the test plates are removed and the vessel is placed on a rotating gear, and the circumferential seams are welded with the vessel rotating at the correct welding speed. This precaution is found advisable as the most suitable welding rods have very fluid characteristics and difficulties due to slag overrunning are encountered unless the welding is carried out in a horizontal position.

When all the welding is completed from the outside, the first run of metal at the bottom of the joint is chipped out from the inside together with the remains of the "scarf," and two sealing runs are then deposited in this groove. The extreme outside and inside runs of metal have had no refining action of a succeeding run and are of a coarsely columnar structure. They are, therefore, dressed off and a flush surface is left.

The vessel, together with its test plates, is then radiographed and exographs of the complete longitudinal and circumferential seams are prepared for examination by the inspecting authority. Any faults are removed by pneumatic chipping and very frequently the fault is small enough to be removed without being seen, so that a radiograph of the slot is necessary. When the fault has been removed the slot is re-welded and again X-rayed. Any nozzles or stand pipes are then welded on, and all welding is completed before the vessel and its test plates are heat-treated for the purpose of stress-relieving. The vessel is placed in a large furnace and the temperature slowly raised to 620° C., and this temperature is maintained for one hour for every inch of thickness before withdrawing the vessel into still air.

The test plates are then cut and test specimens machined for the following tests:

(1) Tensile across the join.
(2) All-weld metal tensile.
(3) Bend.
(4) Impact.
(5) Density.
(6) Micro and macro examination.

Before despatch, the vessel is hydraulically tested to $1\frac{1}{2}$ times the working pressure *plus* 50 lb. per sq.in., during which all seams and nozzles are thoroughly hammered.

Acknowledgment is made to John Thompson (Wolverhampton), Ltd., for permission to publish this information.

Discussion.

Mr. F. G. Shaw (Buxton) said he had taken a considerable amount of interest in the general use of the welding process in engineering structures. The development which had been described was a very modern one. Personally, he had not gone so far as to have any welding tested by X-rays. The method he had used in testing welding was by the testing to destruction of a sample of the work done on the site of the work. He had had test plates specially made and tested to destruction.

There was no doubt whatever that welding was coming very much to the front. There had recently been a discussion as to the virtues of riveting *versus* welding in the Technical Press in connection with gasholders. There was no reason whatever why one should be an all-out welder or an all-out riveter, because in regard to the structures with which gas engineers were most familiar a certain amount of welding was quite practicable. For instance, take the case of a gasholder. There were certain cover plates and packing pieces in the construction of a gasholder which were better welded. There would probably be riveting superimposed on the welding, and the result would be a great increase in the tightness of the structure afterwards. The amount of welding metal stated to be deposited on some of the welds would give an idea as to the immense cost which would be incurred in regard to some of the work. Welding would be considerably cheaper, possibly, if the high cost of electrodes could be reduced. Perhaps Mr. Thompson could give some idea as to the costs of the various high-grade materials for such work as had been shown in the screen illustrations.

Mr. Thompson, replying to Mr. Shaw, said that the reference to welded gasholders brought out a point which should be realized by many people. He had learned that afternoon that the thickness of gasholder plates was probably $\frac{1}{2}$ in. or perhaps $\frac{7}{16}$ in. He understood a $\frac{1}{4}$ in. plate would be thick. A good deal of site welding would have to be undertaken in regard to a gasholder; in fact, he thought it might be considered that it would have to be all site welding. This would mean that the welding would have to be carried out possibly to vertical welds, and to weld such thin material as $\frac{1}{8}$ in. vertically was something of which he had not had much experience. There was no doubt that it could be done; but the characteristics of the machine would be altogether different from the type of machine that the firm with which he was associated were using.

Electrodes were very expensive materials. Therefore, it would have to be carefully considered whether such a method, for thin work which could very easily be riveted, would be a paying proposition. In regard to the vessels to which he had referred in his Paper, cost was possibly not the most important item. For many reasons a much better job was

obtained by welding; and where the material was very thick it was quite impracticable to rivet at all—say, for a 2-in. plate. With a double riveted butt strap, joint rivets would have to be employed probably 7 in. long, and there would be a rivet grip of just under 5 in., and a rivet of that thickness was not perhaps a very satisfactory form of joint. A double-riveted butt strap joint gave a joint efficiency of something in the order of only 70%. In the case of welding it could be safely stated that it was 100%, and in regard to the strength of the weld it was actually over 100%. In actually working out welded joint efficiencies they were not allowed to take 100% as being the figure. For an unfired vessel 90% was taken; for a boiler drum, only 85% was allowed. There was no reason specially for those percentages; they had been decided upon merely by those responsible for the specification. At any rate there was 15% over a riveted joint. Electric welding was by no means cheap. He was really comparing the welded vessels described not so much with riveted vessels as with solid forgings, and solid forgings were a good deal more expensive than welded vessels.

Gasholder Framework.

Mr. F. N. Booth (Keighley) said he would like Mr. Thompson's observations not so much in regard to the bell of a gasholder, but as to the framework. Had he any preference for a built-up girder welded to one riveted together. No doubt a welded framework would prevent moisture getting into the joints between, say, the angle-irons and the flange plates, with consequent reduced corrosion occurring between the two surfaces.

Mr. Thompson said that, in regard to the framework of gasholders, the construction of such sections by welding would be a very satisfactory method; in fact, there was a good deal of constructional steel work which was now being made by electric welding. Girders, and even crane runs, were being made spot-welded with a fillet weld. There were certain difficulties with distortion, but they could be overcome. He had seen some very large welded girders and crane runs where the sections were about 15 in. by 8 in. They were ordinary girder sections built by welding.

Mr. A. L. Jennings (Spenborough) thought that the Gas Industry would be more particularly interested in the welding of such structures as gasholders and mains, &c.; although, upon occasion, high-pressure vessels might be of interest. His welding experience had been confined to a few miles of gas mains. One had to be particularly careful to see that the job was not only theoretically good, but was also practically good. It required close supervision to ensure that the theoretical advantage which could be obtained by welding was not more than offset by the difficulty of obtaining efficient welders and of getting efficient work from them.

He was struck by the large number of failures which occurred in welded joints which had not quite come up to what one would term a reasonable test. Although welded joints might in themselves be entirely strong, and show a very high efficiency as compared with a solid plate, yet he had never been fully satisfied that welding at the joint did not affect the material in the region of the joint, destroying the large grain in the constitution of the metal, and substituting, in place of it, a small-grained structure.

In regard to the welding of gasholders, he must admit that he was somewhat old-fashioned in his point of view. He was rather nervous in regard to the welding of thin sheets of ¼ in. As was well known, the danger of any fracture in a gasholder was not because of any particular leak by a rivet going or anything like that. The strength of the shell of a gasholder was due to the fact that it was kept riveted together as a whole. If any slight ripping of a sheet did occur, then the sheet as a whole had a tendency to split up. For that reason he was not quite satisfied that welding such as had been described in the Paper was entirely suitable for gasholders.

Mr. Thompson thought that whatever alteration in the structure of the metal did take place owing to the heat of welding was not such as materially to affect the strength or safety of the vessel. In regard to gasholders and the thickness of plates required for them, although materials so thin did not form easy substances to work on, nevertheless it had been done, and would be done in the future to a large extent. The strength of a gasholder, taken as a whole, would, he thought, be equal to one which was riveted. In America they were now erecting a certain number of Hortonspheres. The welding of such thin-gauge materials was a rather specialized technique with which he was not very familiar. He was aware that the characteristics of the machines, and various other things, had all to be taken into consideration; but whether that type of work was cheaper or quicker than cold riveting he would not like to say.

For Patching Work.

Mr. W. Fletcher (Garston) said that the type of welding with which Mr. Thompson had been dealing was somewhat new to him. He had had some little experience of welding of gasworks plant generally, and he had nothing but praise for it. He had had no experience of welding gasholder plates except in respect of patching work; quarter-inch patches had been put in most successfully. The small plant they had at the Garston Works worked from 220 volt d.c., its maximum output being 150 amps. for one hour rating. The cost of the plant was approximately £200, and the outlay had been more than justified. There were numerous jobs which could be done with such a welding plant, and it was kept busy the whole day. Jobs which were formerly taken into the fitting shop to have holes drilled for riveting were now in many cases given a complete continuous weld or tack weld.

In a medium-sized gas-works there was any amount of work which could be done by welding. The most important part of welding appeared to be the preparation of the joint; in fact, it took longer to prepare the job than it did to do the actual weld, and if one was following up the weld then one must see that the original weld was scaled absolutely clean.

Mr. James Carr (Stretford), in proposing a vote of thanks to Mr. Thompson, said that he did so with particular interest owing to the fact that Stretford were busy at the present time erecting a 2 million cu.ft. welded holder. Many questions had been asked of Mr. Thompson, and he would just like to add a few remarks to those questions. Mr. Jennings had fears, no doubt, in the back of his mind, with regard to welding on the inner face of the sheets, and burning reducing the thickness. Some three months ago, when they had finished one of the lifts, he decided to have several additional test samples made. One of the secrets of welding was correct fusion. He had no doubt, after carrying out tests, that he had got added thickness to all his lap welds. He had no fear of there being a reduced thickness; there was an added thickness.

Mr. Shaw had raised the question of cost. When they received the tenders the difference in cost between a riveted holder and a welded holder was £2,000 in favour of the latter. It was 18 months ago when the tender was accepted, and the price of metal had probably varied by this time. There was one other point he would like to mention. The Ministry of Health Engineering Inspector came to inspect the holder. It was the first welded one he had inspected, and he spent practically the whole day over it. He, the speaker, was able to assure him emphatically of the satisfactoriness of the tests made with the help of a welder selected at random from a group of fellow workmen. The samples were sent away for examination, and with regard to the tensile test there has been no result less than 94% on all the plates. In erecting a holder the supervision required was very considerable. It was necessary to watch that the electrodes were not mixed in regard to the various welds to be done in the various angles.

Mr. W. Fletcher (Garston) seconded the vote of thanks, which was suitably responded to by Mr. Thompson.

Manchester District Association of Gas Engineers

Autumn Meeting at Manchester

The Ordinary General Meeting of the Manchester District Association of Gas Engineers was held at the Midland Hotel, Manchester, on Friday, Oct. 15—Mr. R. N. Webb presiding.

After the minutes of the last meeting of the Association had been approved, Messrs. A. Whiteley (Kirkburton) and A. J. Riley (Clough Fold) were appointed Scrutineers in connection with the election of Officers for the ensuing year. The result of the election was as follows:

President.—E. Astbury (Liverpool).
Vice-Presidents.—H. Singleton (Huddersfield); T. Reynolds (Stockport).
Hon. Secretary and Treasurer.—H. Burton (Shipley).
Auditors.—R. B. Braddock (Radcliffe); F. Elliott (Leyland).
Committee (three vacancies).—A. Mackay (Stoke); W. Fletcher (Liverpool); A. F. Yates (Goole).

Apologies for absence were announced from the Presidents and Secretaries of kindred associations, and from 45 members.

The members then stood in silence in respect to the memory of the late Mr. J. H. Sillitoe (Manchester) and the late Councillor Joseph Townsley (Ashton-under-Lyne).

The following applicants were elected to membership of the Association: H. L. Bateman (Engineer and Manager, Gas-Works, Dewsbury); J. S. Hall (Manager, Prescot and District Gas Company); R. W. Harris (Engineer and Manager, Gas-Works, Clitheroe); and to associate membership: W. S. Hubbard (Assistant Works Manager, Gas-Works, New Wortley, Leeds).

Presentation of Examination Certificates.

Examination Certificates were awarded to the following successful candidates:

GAS ENGINEERING—HIGHER GRADE.

External Candidates.

2nd Class	J. H. F. Ashton	Preston
,,	R. A. Hollingworth	Cleveleys

Internal Candidates.

1st Class	T. W. Pickthall	Keighley
,,	J. B. Taylor	Stretford
2nd Class	F. E. Benyon	Worsthorne
,,	A. Healey	Rochdale
,,	A. P. Jennings	Cleckheaton
,,	G. W. Kay	Selby
,,	R. H. Unsworth	Rainhill
,,	J. Wilkinson	Crossgates

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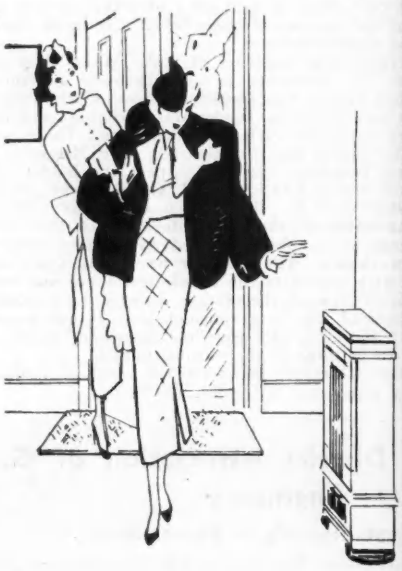

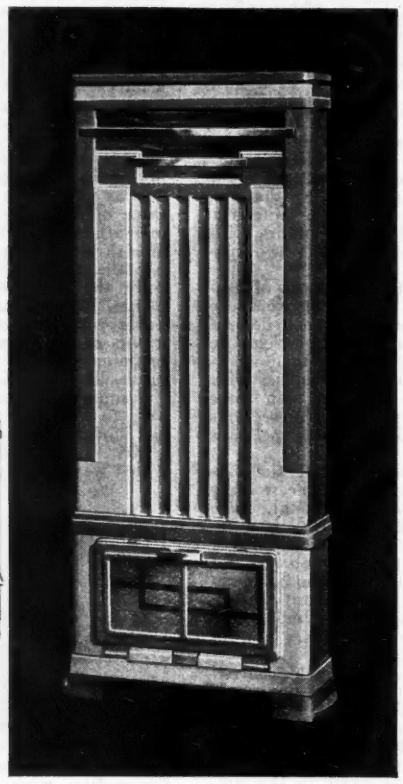

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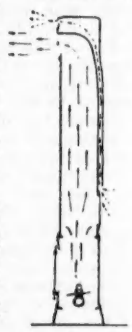

1. The large volume of pure air mixed with the heat stream issues horizontally from the Heater and so quickly warms the apartment.
2. The front body of the Heater is evenly warmed throughout its length.
3. The top and exterior back are kept cool by the constant stream of fresh air passing up the double back. Wall decorations are thus saved from damage by discoloration or deposit.
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EXTERNAL CANDIDATES.

1st Class	R. W. Foulds	Southport
,,	T. W. Pickthall	Keighley
,,	A. C Reid	Leeds
2nd Class	G. Croad	Hebden Bridge

INTERNAL CANDIDATES.

2nd Class	H. Grimshaw	Salford
,,	J. Nangle	,,

The Diploma in Gas Engineering (Manufacture) 1st Class is to be presented to Mr. J. K. Mitchell (Brighouse) at the Autumn Meeting of The Institution of Gas Engineers.

A Paper entitled "Fusion Welded Pressure Vessels" was then presented by Mr. J. H. N. Thompson, B.A., and this, together with the discussion which followed, will be found elsewhere in this week's "JOURNAL."

Yorkshire Junior Gas Association

The 34th Annual General Meeting of the Association was held on Oct. 16 in the Lecture Room of the Fuel Department, Leeds University—Mr. E. R. B. FRENCH presiding over a representative gathering.

Among distinguished visitors present at the meeting were Mr. R. N. Webb (President of the Manchester District Association), Mr. H. E. Bloor (Managing Director, Engineer, and Secretary of the York Gas Company), and Mr. J. Bridge, of Elland.

The HON. SECRETARY (Mr. R. H. McCulloch, of Sheffield) submitted the Annual Report, which stated that the membership of the Association was now 205—an increase of eight during the year.

The HON. TREASURER (Mr. T. G. Lewis, of Leeds) thereafter presented the accounts, which showed a satisfactory position.

A report of the Yorkshire District Education Committee, also presented to the meeting, recorded the various activities of this body. The preparation of a Panel of local examiners in gas fitting and arrangements for holding examinations in gas salesmanship and gas fitting for 1937 was reported, and appreciation was recorded of the kind assistance of engineers of undertakings in this connection. A large number of students were now seeking the advice of the Committee in regard to their studies. Contact with other bodies, including the Gas Education Committee of The Institution of Gas Engineers and the Yorkshire Council for Further Education, had been fully maintained. After protracted negotiations, the Committee had now obtained facilities for students in the Sheffield area who desired to study gas supply—a course in Gas Engineering (Supply) now being available at the Department of Applied Science at Sheffield University. The report concluded with a list of members of the Yorkshire Junior Gas Association who had been successful in the 1937 examinations—namely:

Diploma in Gas Engineering.

J. K. Mitchell	Brighouse

Higher Grade Certificate in Gas Engineering.

T. W. Pickthall	Keighley
A. P. Jennings	Leeds
G. W. Kay	Selby
S. P. Ormerod	Bridlington
J. Wilkinson	Leeds

Ordinary Grade Certificate in Gas Engineering.

A. E. Dickson	Sheffield
G. A. Bentley	Huddersfield

Higher Grade Certificate in Gas Supply.

T. W. Pickthall	Keighley
A. C. Reid	Leeds

Ordinary Grade Certificate in Gas Supply.

R. Dyson	Huddersfield
G. Brook	,,
J. Brook	Batley

Ordinary Grade (Single Subject) in Gas Engineering.

F. Roberts	Bradford

Ordinary Grade (Single Subject) in Gas Supply

H. E. Birks	Goole

New Officers.

The following officers and Council members were then elected for the Session 1937-38:

President.—J. Richmond (York).
Senior Vice-President.—A. Wylie (Sheffield).
Junior Vice-President.—T. G. Lewis (Leeds).
Hon. Secretary.—R. H. McCulloch (Sheffield).
Assistant Hon. Secretary.—T. Hayes (Leeds).
Hon. Treasurer.—T. G. Lewis (Leeds).
Hon. Auditors.—J. R. Firth (Bradford) and G. P. Jennings (Bradford).
Representatives on the District Education Committee.—R. N. Webb (Leeds), A. M. Clucas (Leeds), A. Wylie (Sheffield), and V. J. J. Siddons (Barnsley).
New Members of Council.—W. S. Hubbard (Leeds), C. A. Newham (Leeds), A. Pickard (Knottingley), and G. Griffiths (Bradford).

Mr. E. R. B. FRENCH, introducing his successor in the presidential chair, said that Mr. J. Richmond was well known among the members, and was the fourth generation of his family in the Gas Industry. They were delighted to have his father with them that day, and it must be a great delight to him to see his son in the highest position the Association could offer.

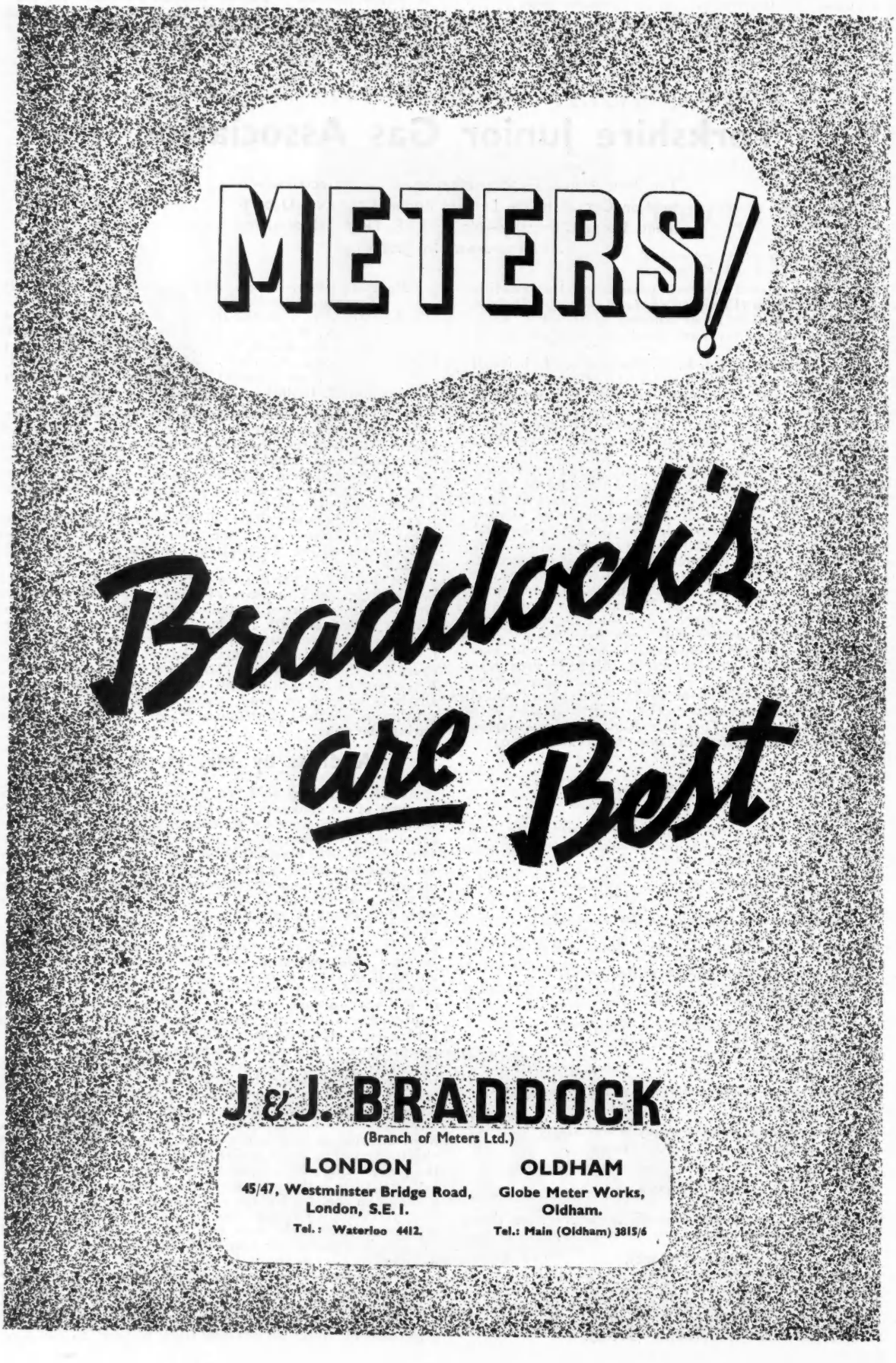
The NEW PRESIDENT (Mr. J. Richmond) thereafter presented Mr. French with the Past-President's Medallion and expressed the Association's thanks to him for his services.

Mr. FRENCH, in voicing his appreciation, said that if he had achieved any measure of success he wished to give credit to the support of his fellow officers and Council members, who had borne a full burden of the work, and particularly their enthusiastic Hon. Secretary, Mr. McCulloch, who had given up many leisure hours in untiring effort for the Association. Mr. French also thanked the Engineers of Yorkshire and officers of the Manchester District Seniors for kind support and advice, and the gentlemen who had contributed Papers to the Association during the year.

Address by Mr. H. E. Bloor

Mr. H. E. BLOOR said he felt the task of addressing a meeting of an association which called itself Juniors, but whose members were by no means all juniors in years or experience, was a task of much difficulty, especially as they might quite reasonably be under the belief that some who were regarded as Seniors were senior by Act of God or good fortune and not necessarily by personal deserts. It was to be presumed that one of the objectives of any such association of men in a great industry was to combine in their effort to give good service to society in general, to give a square deal to their employers and their public. But when all was said and done they were gathered in that association primarily with a view to increasing their own individual value in the Industry and in the very proper hope that that increased value and improved service would in due course redound to their own professional advancement. That being so, the Association became an important platform for those men of ambition who felt they had something to say and knew that what they said would be duly noted by, among others, Seniors upon whom a good deal of that prospective professional advancement might depend. It should never be forgotten that employers and Engineers and Managers were always on the look out for men of ambition and ability and that an Association of that kind was one of the places where they were likely to look.

"Just what is the main distinction between a Senior and a Junior in the Gas Industry?" queried Mr. Bloor. Their Industry comprised men who, by its very nature, had at some period of their lives received a rather specialized training in a particular branch of the Industry. If a man was so successful as to attain the position of a chief—which he presumed was more or less the dream of most students—he suddenly found himself in the position of becoming responsible for a wide range of jobs quite outside of that for which he was specially trained, and he had the somewhat difficult task of re-orientating himself to the new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situation. If Mr. Bloor were asked for a definition of Senior and Junior, therefore, he would say that the Junior was responsible for carrying out policy as decided by the Senior. Juniors, therefore, were essentially specialists. They were engaged on a special line to which their training had been directed, and this involved the obvious necessity of adopting a distinct line of study. Specialists of abnormal powers in their particular direction might achieve a distinctive career in their own speciality rather than become chiefs in the more general sense. To become a Senior in the sense of an administrative chief, of course, meant that whatever might have been his special study in earlier years, a man must take up eventually some knowledge of the whole wide field of Gas Industry affairs.

No doubt the majority of serious-minded Juniors—and he took it those who gave up their Saturday afternoons to attending meetings of their Association must be such—looked hopefully to a future in which they might be chiefs. A vast number of new lines of thought and action inevitably presented themselves to a man on taking up control. Every decision on policy then involved an act of Prophecy, which was very different from the task of the Junior. The Junior had a straight issue—he was an instrument to carry out policy efficiently and enthusiastically, working on the plant and equipment provided; making the plant work well; keeping appliances in order; selling goods as selected and on terms settled by others. As chief or Senior he would sometimes have to think very hard as to whether his policy and his plant would fit into the conditions of his undertaking with success. Good policy would work out cumulatively for good—bad policy usually worked progressively badly. While it was the duty of the Junior to carry out policy as directed by his Seniors, Mr. Bloor commended the adoption—by the man who hoped some day to become a chief—of a mental attitude of challenge towards that policy. He should try to test the policy of his Seniors in his own mind and endeavour to see how it was aimed to improve the undertaking or whether there seemed to be anything which might make it go wrong. Accept the Seniors' policy officially, by all means, for there was no alternative, but never be a mere "accepter" without trying to form some private opinion on it while carrying it out. A man must go through that stage of thought before he could hope to reach the final stage of being a settler of policy himself.

An inevitable result of working hard on any subject, proceeded Mr. Bloor, was to produce an affection for it. Was it not the subject one knew most about, anyway? The affection went deeper than surface and touched some definite thing in the mental processes. They would always notice that if they had occasion to help any man they became naturally drawn towards that man. Help any cause and the same thing happened. Enthusiasm was quite often the product of mere hard work; but there was a danger in enthusiasm if not rightly directed. Industry, indeed, was strewn with the wreckage of unbridled specialism and enthusiasm. They must never forget the necessity of clinging firmly to the vital point that all effort in industry was going to be tested in the financial laboratory of the accountant, whose laboratory report was known to the directors of the undertaking as the balance-sheet. Always remember that there must be economic soundness leading to profit out of every act of policy. One sometimes heard people speak of a "beautiful plant," but there was no such thing in industry, in the sight of the man of policy, unless its results were first-class financially. Even a full-blooded sales effort might—in the long run—prove wrong, or a "beautiful" appliance prove a pitfall. Long before responsibility for policy came to a man the power to influence it might arise, so the Junior of to-day with ambitions to be the Senior of to-morrow must keep up his study, not only of his speciality subject, but also of policy and economics.

Holding Companies.

Mr. Bloor said his hearers might possibly like him to say something on the very important subject of the reaction of gas undertakings to holding companies. The idea had appealed to him, because it had long seemed evident that the Gas Industry was faced with the competition of something which was likely shortly to become something in the nature of a gigantic national trust. This, of course, was essentially a matter of high policy. It was obvious that the Industry could not continue successfully to face this sort of competition—the Government-favoured competition of electricity—working on the basis of isolated units. The Gas Industry had had to adopt a policy of expansion which, admittedly, might have serious repercussions on the personnel in the Industry. Juniors, like everybody else, must obviously be affected by this amalgamation movement.

"I sincerely hope," said Mr. Bloor, "that it will work out to your advantage. I think there can be little doubt that it will work out strongly to the advantage of men who can show superior qualities. There has always been, under the system of separate and often small companies, a certain amount of difficulty in finding an outlet for the man of outstanding merit. Brains and character have sometimes been hard to locate, but will never be long hidden under the system of a holding company. The ultimate justification of holding companies will be seen in the same gentlemen working in financial laboratories and producing balance-sheets. Settlement of policy, of course, becomes a gigantic responsibility for those called upon to control the fortunes of numerous undertakings with the most diverse local conditions and requirements. I would bespeak your sympathy and your patience in assessing results of this new policy of holding companies. Time must clearly be required for judgment."

Mr. Bloor said he had spoken of enthusiasm and how there may sometimes be mistaken enthusiasm. One of the most stupendous monuments to misguided enthusiasm ever known in history, he suggested, was that of the State towards electricity. The unfortunate feature of enthusiasm was that if matters went far enough the enthusiast lost the inhibitions usual to English life—he adopted the attitude that "The end justifieth the means." There were those, he was afraid, who would cheerfully sacrifice a vast industry like that of gas, with a hundred years of great service to the State, to make way for the newer enthusiasm, electricity. This, said Mr. Bloor, was no mere rhetoric on his own part. A leading authority in the electricity world had declared that both gas and electricity were no longer necessary, and proceeded to indicate what he considered the service of the future.

"Our business, as both Seniors and Juniors in the Gas Industry," said Mr. Bloor, "is to see to the postponement of that 'future' as long as possible, so long indeed that the vision may fade. That can only be achieved if Seniors adopt the right policy and Juniors work loyally and enthusiastically to carry it out. If the Gas Industry is to keep its rightful place in the years to come—and I firmly believe it will—it will require, as never before, the enthusiastic support of all concerned in such new policies as may be found necessary. Some definite concentrated line of action will have to be settled, and it will be for everybody to put his best into the effort to make the best of whatever has to be done."

"I will end on the note of prophecy again," concluded Mr. Bloor. "I myself entered the Gas Industry thirty-eight years ago to the accompaniment of confident predictions of friends that the Industry would be dead by the time I was grown up. Those thirty-eight years have passed, and our Industry is greater than ever and is still making progress. I will venture with confidence that thirty-eight years from now there will still be a great and flourishing Gas Industry. If that prophecy is to prove true you younger people will have to carry the major part of the job. Get to it, I say; more power to your elbow, and good luck attend you."

Mr. A. WYLIE proposed a hearty vote of thanks to Mr. Bloor, and Mr. J. W. CARLTON (Shipley) seconded.

Mr. R. N. WEBB, called on by the President to speak a few words in his capacity as President of the Manchester Seniors, said there was no need for any young man in the Gas Industry to be afraid for the future if he would study his calling thoroughly. Those who went through the Institution's Education Scheme and obtained the Diploma were assured of a standing in the Industry which, whether they reached the top of the tree or not, would secure them acceptance and respect throughout life. In regard to the important subject of holding companies, Mr. Bloor had spoken words of wisdom. With a proper application of the advantages of such companies there could be little doubt the Industry could benefit greatly. There were vast possibilities in the Industry for the future and, as Mr. Bloor had pointed out, it was in the hands chiefly of the younger men to see that they were brought about. Mr. Webb paid a tribute to the great helpfulness of Leeds University and similar institutions in furthering the Gas Industry on the scientific side, in giving a lead and guidance as to the best methods of making, purifying, and using gas. The Industry was indebted to the abilities and enthusiasm of men like Prof. Cobb, Mr. Hodsman, Mr. Wood, and others of the staff at Leeds whom they of the Yorkshire Association had long regarded as among their very good friends.

A vote of thanks to Prof. Cobb and the authorities of Leeds University for their customary hospitality in affording facilities for the opening meeting of the session was carried on the proposition of Mr. J. HUBBARD (Leeds), seconded by Mr. A. PICKARD (Knottingley).

Mr. H. J. HODSMAN, responding in the absence of Prof. Cobb, said it was always a pleasure to the University authorities to have the Yorkshire Juniors hold their opening meeting there. Indeed, if they changed that policy they of the University would feel something was wrong.

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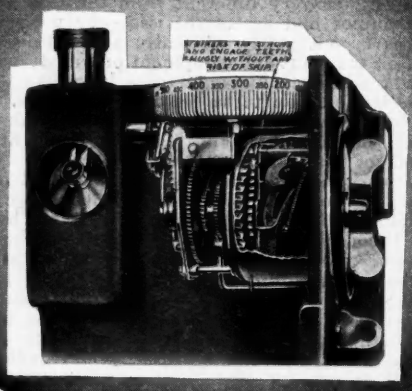
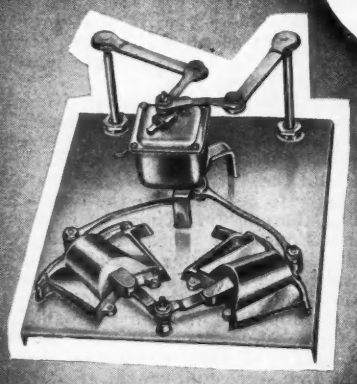
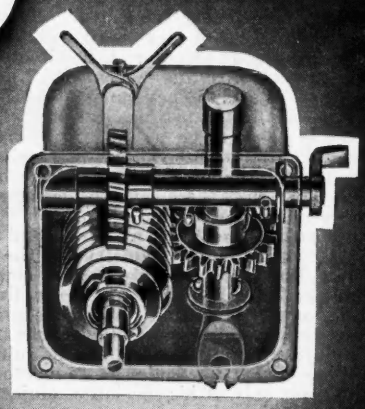


THE COMBINATION WHICH HAS WITHSTOOD THE TEST OF TIME





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It was rather a special pleasure that day because the Association's new President (Mr. Richmond) was one of the Department's old students.

Following the meeting the members adjourned to the Victory Hotel, Leeds, for the annual dinner and smoking concert. During the course of the evening Mr. J. A. Derbyshire (Shipley) was presented with the Clayton Award (a gold medal) for the best Paper read before the Association during 1936; and Mr. J. Castle (Brighouse) was presented with an award of £5, made by Mr. C. S. Shapley (Leeds), for the best Short Paper read to the Yorkshire Junior Association during the 1936-7 Session.

Trade Notes

George Wilson Gas Meters, Ltd.

Messrs. George Wilson Gas Meters, Ltd., regret to state that their London Manager, Mr. A. C. Frost, has been advised that six months' complete rest is essential on health grounds. Mr. Frost will begin his vacation on Nov. 6. The firm much regrets this break in 15 years' loyal and continued service, and feel sure that his many friends will join in wishing him a speedy recovery.

"Newman-Milliken" Valves.

The "Newman-Milliken" glandless lubricated plug valve is the subject of the latest catalogue of Messrs. Newman, Hender, & Co., Ltd., Woodchester, Glos., to whom we are indebted for a copy.

Messrs. Newman, Hender have greatly extended the range of these valves, particularly those suitable for the highest operating pressures. We learn that Messrs. Bell's Asbestos and Engineering Supplies, Ltd., of Slough, carry a stock of "Newman-Milliken" valves, and undertake the responsibility of giving pre-sales advice and after-sales service throughout the British Isles.

The Incandescent Heat Company, Ltd.

Considerable extensions have been made to the foundries of the Incandescent Heat Company, Ltd., Cornwall Road, Smethwick, Birmingham, and they are now turning out approximately fifty tons a week of grey-iron castings of high tensile strength, ranging in weight from a few pounds to four tons. In addition to their own work, the Company are supplying a large number of castings to engineering and allied trades. They are also producing special heat resisting metal capable of withstanding temperatures up to 1,100° C. without deformation and with, it is claimed, absolute resistance to oxidation and sulphur attack.

"Jiffy" Assisted Sales Service.

The co-ordination of "Jiffy" sales is the subject of a booklet we have received from the "Jiffy" Automatic Clothes Washer Company, Ltd., Accrington, Lancashire. The assisted sales scheme of the Company has been devised for dealers and other distributors to promote the sale of "Jiffy" clothes washing machines and wringers. The Company are prepared to appoint a chain of selected traders throughout the British Isles as "Approved Dealers;" such appointments, however, will not constitute any sole agency. The "Jiffy" mobile selling organization will be placed at the disposal of the approved dealers to demonstrate to their customers. When required, financial facilities will be arranged on behalf of the dealers to enable them to offer "Jiffy" products to their customers on hire-purchase or deferred purchase terms, and full particulars will be furnished, with the necessary forms, on request.

"Newbridge" Gas Controllers.

In submitting their new catalogue, the Horstmann Gear Company, Ltd., Newbridge Works, Bath, state that they are confident all gas undertakings and public lighting authorities will find therein a type of "Newbridge" controller suitable for every purpose. The various models described are the results of considerable experience in the manufacture of scientific instruments and clock controllers since the beginning of the century, and have been largely evolved through collaboration with gas engineers and others responsible for public lighting.

The various parts of the controllers are described in detail, together with details of construction which lend precision to these instruments. Included in the catalogue is a map of England and Scotland divided into regions, for each of which is given a lighting schedule. Many different models of clock controllers are dealt with, and prominence is given to the Newbridge "Comet" igniter. The makers state that the success of "Comet" ignition is exemplified by its adoption by some of the largest gas undertakings and public lighting authorities in the country. The economies which are claimed to be effected by the adoption of "Comet" ignition are stated to have been proved by actual test under working conditions and not merely by calculation. By eliminating by-pass consumption it is claimed that an average annual saving of about 1,500 cu.ft. per lamp is effected and reliability of ignition assured.

Shades for Gas Lighting.

Shades for gas lighting are the subject of a new catalogue published by Lighting Trades, Ltd., and Welsbach Light Company, Ltd., 51-55, Garratt Lane, Wandsworth, S.W. 18. Many attractive models are to be found in the list for all types of gas fittings.

Testing Electrical Installations.

A broadsheet with an arresting cover in three colours has been published by Messrs. Evershed & Vignoles, Ltd., Electrical Engineers, Acton Lane Works, Chiswick, W. 4. The need for periodical testing of insulation resistance and continuity of conduits and bonding is shown by the fact that interruption of electrical services through failure of insulation in untested machines and circuits may cost many pounds apart altogether from the danger it constitutes to human life. An Evershed & Vignoles' "Megger" offers a sound insurance against such occurrences for a modest capital outlay.

Colour Scheming with "Foochow."

For many years the Gas Industry has been accustomed to associating the products of Messrs. Donald Macpherson & Co., Ltd., with painting work of all kinds on gas-works. More recently, too, gas fires, water heaters, and domestic appliances generally have assumed gayer aspects in conformity with the dictates of modern "taste" and fashion, and in enabling gas undertakings to satisfy their consumers in this respect Messrs. Donald Macpherson, with their highly developed research and production organization, have played a leading part. For example, it would not have surprised the visitors during the B.C.G.A. Conference to the magnificent new showrooms at Manchester to learn that a large number of the gas appliances on show were finished with "Foochow" enamels. On the other hand, it was news to many of them that the greatly admired interior decoration of the premises themselves had been carried out in "Foochow" decorative materials.

Messrs. Donald Macpherson invited attention to this newer side of their business, with the assurance that the same care is devoted to it as that which has gained such an excellent name for the industrial side. The Firm maintains a staff of architecturally skilled men, qualified to assist in the preparation of attractive colour schemes, to help in the drawing up of specifications, and to see that the decorative work is carried out satisfactorily. For the consideration of those who have schemes of decoration in contemplation, they have prepared colour cards which offer suggestions in many most attractive combinations.

"Durasteel" Roofing and Fire Protection Panels.

We have received from Durasteel Roofs, Ltd., Oldfield Lane, Greenford, Middlesex, the results of some convincing tests involving fire and explosion carried out at their factory in the presence of consulting engineers and technical officials of Government Departments on specimens of "Durasteel" roofing and fire-protection panels.

It was shown that an incendiary medium composed of 3 lb. of "Thermit" iron will easily penetrate a $\frac{1}{4}$ in. mild steel plate, the recorded time in this case being 9 seconds from the moment of ignition. An equal quantity of "Thermit" simultaneously ignited on $\frac{3}{8}$ in. "Durasteel" 3DF2 sheeting burnt itself out without penetration. Although the topside surface of the "Durasteel" had fused, inspection after the test showed the underside to be unmarked. A demonstration of real fire conditions was created by quenching a good timber-and-petrol blaze inside a small hut constructed from wood framing shielded and lined with sheets of 3DF2 fire protection panelling. Pyrometer readings during the fire amounted to 670° C., and after 7 minutes, while the temperature still read 650° C., the door of the hut was opened, and a hose played on the hot interior. Observers inspected the hut inside and out immediately after the test, and were able to record no damage to the 3DF2 sheets, which were quite unaffected by the fire and quenching. It was noted that the same hut had been subjected to earlier fire tests, and no sheets had required replacement for the present trials. This fire test hut, which measured 6 ft. by 5 ft. by 5 ft. was later put to an explosion test when a charge of 1 lb. of blasting powder contained in a heavy steel cylinder was fired inside the structure. Following the explosion, the hut was greatly distorted, its roof being almost lifted off together with the chimney but no splintering of the sheeting was apparent.

George Wilson Gas Meters

Larger Turnover and 10% Dividend

Mr. J. H. Wilson on Good Outlook

The First Ordinary General Meeting of George Wilson Gas Meters, Ltd., was held on Oct. 15 at Coventry.

Mr. J. H. WILSON (Chairman and Managing Director) said: Ladies and gentlemen,—The Directors' report and the audited accounts for the year ended June 30, 1937, have been in your hands for some days, and, with your permission, I will take them as read.

It gives me great pleasure to welcome you here on the occasion of the first annual general meeting. I should like to take this opportunity of thanking you for the confidence you have placed in us by becoming shareholders of the Company.

Record Turnover.

It is a source of gratification to your Directors to announce that the year's production has exceeded all previous records of the vendor Company, the turnover for the year showing an increase of more than 11% over the previous year, and that the expectations for the year as disclosed in the offer for sale issued in February last have been more than fully realized.

The Company, as you are aware, became incorporated as a public company on Feb. 10, 1937, and the profits earned prior to that date belong to the vendor company in accordance with the agreement for sale of the business. The profits earned since the date of incorporation are therefore available for distribution, and you may be interested to know that these profits are relatively greater than the profits earned prior to incorporation, owing to the fact that the monthly turnover increased in the latter part of the year.

The profits earned since incorporation, after making full provision for taxation and National Defence Contribution, amount to £6,873. Of this sum £751 is required to cover the accrued Preference dividend and the Directors recommend that the balance be dealt with by payment of an Ordinary dividend of 10% (actual), less income-tax, requiring £3,750 and by carrying forward £2,372.

Strong Financial Position.

Turning now to the balance-sheet you will observe that all the assets are of a productive nature and that no items are included for goodwill or preliminary expenses.

You will notice that the fixed assets which consist of freehold property, plant, machinery, and loose tools, &c., amount to £71,058, and the current assets—namely, stock, debtors, investments, and cash—to £59,397, giving total assets of £130,455. Deducting from this total the current liabilities amounting to £23,581 including provision for taxation, we arrive at a figure of net assets of the Company amounting to £106,874. This represents the share capital of £100,000 and the balance on profit and loss appropriation account of £6,874.

The liquid assets position is a healthy one, the floating assets being sufficient to cover the amount of current liabilities about 2½ times. As regards the fixed assets, not only has generous provision been made for depreciation, but the sum of £9,747 has been expended during the year on additions and alterations to buildings, plant, and machinery. This capital expenditure has been incurred with the object of providing your Company with a greater capacity for production, and of enabling the work to be carried out with greater accuracy. Also we have equipped the factory with an up-to-date development and testing department. Furthermore, as referred to in my speech at the statutory meeting, we have been able to purchase a plot of land adjoining the factory so as to provide for further extensions in the future, if the need arises. Your Directors are confident that these developments will enable the Company's future output to be increased, and I can assure you that no effort will be spared in seeking and exploiting the possibilities of expanding the Company's business.

Good Trading Prospects.

I should like now to make a few remarks about the condition of our trade generally. For myself, I feel the results obtained are most satisfactory. During the past year we have paid considerable attention to the matter of improving the layout of the works with a view to employing the most economical methods of production. Our research department has been very active, with satisfactory results.

The prospects at present are certainly very bright—orders on hand are good and with the improved layout of the works we hope to secure even better financial results.

It is fitting that I should conclude my remarks by expressing my appreciation of the assistance rendered by my co-Directors and the staff and employees of the firm, without whose co-operation the present results could not have been obtained, and I wish to take this opportunity of thanking every one of them.

I now beg formally to move that the report of the Directors and statement of accounts for the year to June 30, 1937, be approved and adopted, and that a dividend on the Ordinary shares of 10% (actual), less income-tax, be declared, and that the balance of £2,372 3s. 5d. be carried forward to next year's account.

It is proposed to pay the Ordinary dividend on Oct. 31 next, together with the first dividend on the Preference shares, which will be due for payment on that date.

The report and accounts were unanimously adopted; the re-election of the retiring Director was proposed by Mr. D. C. E. Poole and seconded by Mr. W. A. D. Dobson, and duly carried; the Auditors re-appointed; expressions of appreciation by various shareholders were given, and the meeting concluded with a hearty vote of thanks to the Chairman.

Traffic Vibration

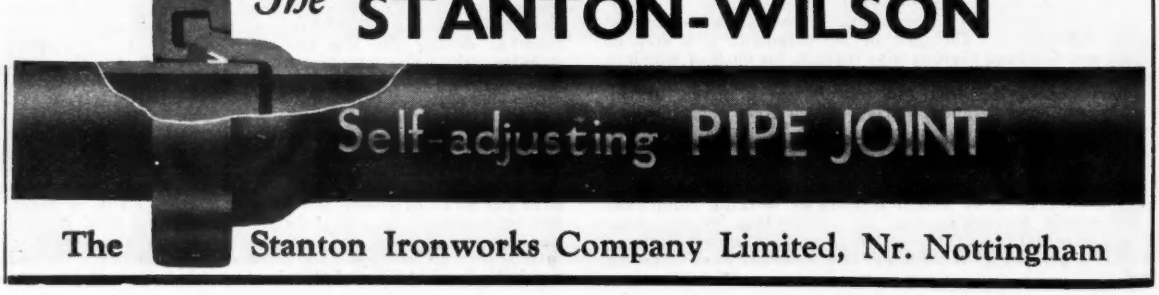
Rigid or Self-adjusting Joints?

Not many of the problems brought into being by the remarkable growth of road transport during the last decade are capable of easy solution.

There is at least one exception, however. For instance, though much has been heard of the danger caused to historic buildings by traffic vibration, the harmful effects of such vibration on water and gas mains are not so apparent. To water and gas engineers responsible, however, for the maintenance of these essential public services, this was a very real problem until a few years ago, for rigidly-jointed mains could not be expected to withstand the severe vibration caused by modern conditions.

Some six years ago the Stanton Company introduced the Stanton-Wilson Self-adjusting pipe-joint to overcome this and similar difficulties. That it has successfully done so is proved by the fact that more than 1,500 miles of Stanton-Wilson mains have now been laid by over 750 public authorities.

The STANTON-WILSON



The Stanton Ironworks Company Limited, Nr. Nottingham

Gas Undertakings' Results

Deal and Walmer.

The Directors' report on the working of the Deal and Walmer Gas Company for the year ended June 30, 1937, states that after paying in respect of the half year ended Dec. 31, 1936, dividends at the rate of £6 10s.% per annum on the redeemable preference stock; and £6 10s.% per annum on the Ordinary Capital Stock: there is a balance available for dividend of £6,276, out of which the Directors recommend the payment of a dividend on the ordinary capital stock in respect of the half-year ended June 30, 1937, at the rate of £7 5s.% per annum, less income-tax, making a dividend of £6 17s. 6d. less tax for the year, which, together with payment of the preference dividend for the June half-year will absorb the sum of £3,500, and leave £2,776 to be carried forward to the credit of the current year. A resolution will be proposed at the General Meeting sanctioning the creation and issue of new preference stock for the purpose of providing money to pay off the existing 6½% preference stock which is to be redeemed this month in accordance with the conditions of its issue.

Dundee.

The report of the Dundee Gas Department for the year ended May 15, 1937, states that the quantity of gas made amounted to 1,992,028,650 cu.ft. of coal and carburetted water gas, compared with 1,891,636,712 cu.ft. in 1935-36, an increase of 100,391,938 cu.ft.; the gas sold, inclusive of that used on works, amounted to 1,802,966,650 cu.ft., compared with 1,785,628,625 cu.ft., an increase of 17,338,025 cu.ft. The new showrooms, opened on March 25, 1936, have proved a splendid asset to the Department. The amount of business being done, and the interest created by the numerous demonstrations in cookery, &c., have surpassed expectations. The sale of gas appliances on hire-purchase shows an increase of 110% over last year, while sales on a cash basis also record a very satisfactory improvement. The Department has again to provide for a considerable increase in the price of coal, together with a rise in railway rates. As compared with the cost of coal carbonized last year, new contracts entered into show a rise of fully 2s. 10d., which, with the increased railway cost, makes the total increase approximately 3s. 1d. per ton. After allowing for balances of old contracts, the increased cost of new coal to the Department will exceed a figure of £13,000 for the year. The sound financial position of the Undertaking will enable the rates for gas being continued for another year without any increase.

Newcastle-under-Lyme.

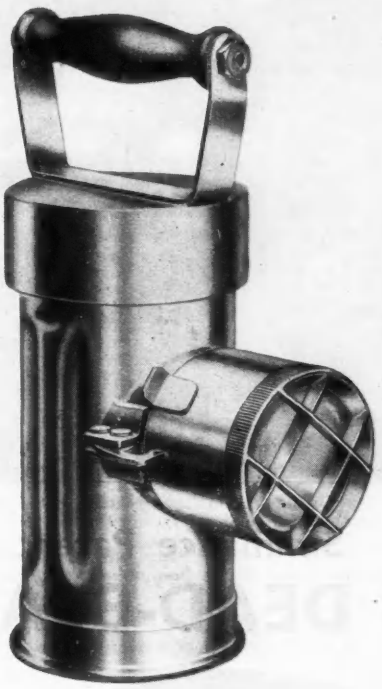
The Newcastle-under-Lyme Gas Department reports that for the year ended March 31, 1937, there has been an increase of 11·01% in the quantity of gas sold, an increase of £801 in the gross profit and £147 in the net profit realized compared with the previous year. This is the first year that the revenue accounts for the Newcastle and Chesterton Works are shown as one. The total gas sold to private consumers was 302,536,200 cu.ft., against 272,521,100 cu.ft. last year, an increase of 30,015,100. The income from public lighting is £4,957 or £883 less than last year. The number of lamps lighted is 1,606 or 156 more than last year. Of residual products, tar brought in £2,915, against £2,491 last year, an increase of £414. Coke produced £988 more than last year, the comparative figures being £11,413 for 1937 and £10,425 for 1936. Spent oxide brought in £312, against £118 last year. The gross profit carried to the net revenue account is £8,047, against £6,999 last year, an increase of £1,048, equal to 14·9%. The net balance carried to appropriation account is £709, against £316 last year. The total meters in use is 16,909, against 16,132 last year, an increase of 777 or 4·8%. Appliances sold have been 1,497, against 1,360, an increase of 137 or 10%.

The Gas Supply Company, Ltd.

The report of the Directors of the Gas Supply Company, Ltd., for the year ended June 30, states that the accounts for the year show a profit of £16,856, to which is added the amount brought forward from last accounts, £389, making £17,245, which, less interim dividend, at the rate of 6% per annum, paid March 24, 1937, £8,332, leaves a balance of £8,913. The Directors recommend this be applied as follows: Dividend at the rate of 5% per annum for the half-year ended June 30, 1937 (making 5½% for the year), £6,944; transfer to reserve account, £500; transfer to provision for income-tax, £1,050; and carry forward, £419. The gross revenue for the year shows a satisfactory increase. The costs of wages and materials have increased during the year—particularly in Queensland, where the majority of the Company's business is. Rather than increase the price of gas, and thus lose business in the competitive area, the Directors considered it advisable to continue the effort to increase sales of gas. This will have the effect of reducing the overhead costs per unit, and, it is hoped, compensate for the increased rates of wages and prices of materials. The volume of gas sold was 9% more than last year, or 98% more than for the year ended June 30, 1932 (five-year period). The number of new services connected for the year was 464 (compared with 532 last year). The number of new appliances connected was 1,854 (compared with 2,238 last year) The new carbonizing plants at Cairns and Ararat were completed during the year and extensions of mains at all branches were carried out, in order to supply new customers.

NIFE

SAFETY LAMP
type NG7.



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Fitted with NIFE Steel Plate Accumulator as standardised in Admiralty handlamps and thousands of Miners' Lamps throughout the World.

Write for publication No. 1337.

TRIALS GLADLY ARRANGED.

BATTERIES LIMITED
HUNT END WORKS REDDITCH

Simmance Patent

DEAD-BEAT INDICATORS

These Indicators can be supplied for ranges 0-1″ w.g. (or ·5-0-·5″) to 400 lbs., or any intermediate range, either vacuum or pressure, or in any combination.

can be used with advantage on all Gas Works. Readings of pressure or vacuum can be made instantly, even from a distance, with greater accuracy than is possible by using water-tube gauges. There is economic advantage, too, in the fact that Dead-Beat Indicators require no maintenance charges for cleaning and replacement of glasses, and remain in service for many years.

ALEXANDER WRIGHT & CO., LTD. — WESTMINSTER, S.W. 1.

Gas Markets and Manufactures

Stock Market Report

(For Stock and Share Lists, see later pages)

As was anticipated, the Italian reply to the Anglo-French invitation on the Spanish question led to a renewal of liquidation and a sharp fall in prices in most sections of the Stock Exchange at the commencement of business last week. Fortunately, however, this dismal state of affairs was of short duration and on Wednesday a much brighter tone prevailed. The gilt-edged market showed a good example and British Funds on the whole closed fractionally higher than a week ago. Bargain hunters commenced work in several sections and with jobbers short of stock prices moved up rapidly. While it cannot be said that anything like complete confidence has been restored, it is evident that, in the absence of further complications, markets are in the mood for a slow and steady recovery.

The Gas Market is usually one of the last to feel the effects of any general fall in prices and is also in the same position when a recovery comes along. Last week was no exception to this rule, and if anything prices became even more depressed. In only a few isolated cases did the prices of recorded transactions exceed those of the previous week. In the Official List all the movements in quotations were downwards, and included a sharp drop of 9 points in Uxbridge ordinary to 140½ and 5 in Harrogate consolidated to 117½. No transactions have been recorded in the latter stock so far this year, the last business reported was in September, 1936, at 130-133½. Wandsworth and Watford ordinaries both dropped 2, and South Metropolitan lost another 1 to 101½. With the exception of a fractional drop in Hartlepool ordinary at the Newcastle Exchange, prices in the Provinces remained unchanged. The only upward movement of the week occurred in Oxford ordinary in the Supplementary List with a gain of 2 points to 207½.

Current Sales of Gas Products

The London Market for Tar Products.

LONDON, *Oct.* 18.

There are a few changes to report in the prices of tar products, which are as follows:

Pitch, 38s. per ton f.o.b.
Creosote, 6d. to 6¼d.
Refined tar, 8¾d.

Pure toluole, about 2s. 5d.; pure benzole, 1s. 9d.; 95/160 solvent naphtha, 1s. 8d.; pyridine is very scarce for early delivery, and the price for 90/160 is said to be 11s. to 12s.; all per gallon naked at makers' works.

Tar Products in the Provinces.

Oct. 18.

The average prices of gas-works products during the week were: Gas-works tar, 24s. 3d. to 29s. 3d. Pitch—East Coast, 37s. to 38s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 37s. to 38s. 6d.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal tar, crude naphtha, in bulk, North, 8d. to 8½d. Solvent naphtha, naked, North, 1s. 5½d. to 1s. 6d. Heavy naphtha, North, 1s. 3d. to 1s. 3½d. Creosote, *ex* works, in bulk, North, liquid and salty, 5d. to 5½d.; low gravity, 4⅝d. to 4½d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid 60's, 4s. 1½d. to 4s. 3d. Naphthalene, £18 to £20. Salts, 90s. to 95s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Oct.* 16.

There is still very little movement in the market, although on the whole quotations remain unchanged.

Crude gas-works tar.—Actual value is 37s. to 38s. per ton *ex* works in bulk.

Pitch is a dull feature at round 30s. to 32s. 6d. per ton f.o.b. Glasgow for export, and 30s. per ton *ex* works in bulk for home trade.

Refined tar is being offered freely at 3d. to 3½d. per gallon free on rails for export, and 3½d. to 3¾d. per gallon *ex* works in buyers' packages for home trade.

Creosote oil.—With distillers comfortably placed prices are well maintained as under: Specification oil, 5½d. to 5¾d. per gallon; low gravity, 6½d. to 6¾d. per gallon; neutral oil, 5¼d. to 5½d. per gallon; all *ex* works in bulk.

Cresylic acid.—Market is quiet, but prices are unchanged as follows: Pale, 97/99%, 3s. 11d. to 4s. 2d. per gallon; dark, 97/99%, 3s. 8d. to 3s. 10d. per gallon; and pale, 99/100%, 4s. 4d. to 4s. 7d. per gallon; all *ex* works in buyers' packages. With firm business a discount would probably be accepted.

Crude naphtha.—Available supplies command round 6d. to 6½d. per gallon *ex* works in bulk, according to quality and district.

Solvent naphtha remains steady with 90/160 grade at 1s. 5d. to 1s. 6d. per gallon, and 90/190 heavy naphtha at 1s. to 1s. 1d. per gallon.

Motor benzole is quoted at about 1s. 4½d. to 1s. 5d. per gallon.

Pyridine.—Prices are nominal at 10s. to 11s. per gallon for 90/160 grade, and 11s. to 12s. per gallon for 90/140 grade.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole . . .	0 9½	to	0 10	per gallon at works
Motor ,, . . .	1 3	,,	1 3½	,, ,, ,,
90% ,, . . .	1 4	,,	1 4½	,, ,, ,,
Pure ,, . . .	1 8	,,	1 8½	,, ,, ,,

Contracts Advertised To-Day

Benzole Plant.

Wallasey Gas Department. [p. 242.]

Vertical Retorts.

Ilkley Gas Department. [p. 242.]

THE GLOVER-WEST SYSTEM

GETS THE MOST OUT OF THE COAL

The ease with which heat can be concentrated or distributed at will in the Glover-West vertical retort setting makes possible just that heat treatment required by the particular gas coals available. And this applies to recognised carbonizing coals throughout the world. Many of them have been investigated under full-scale working conditions in the test installation on the research gas plant at our Manchester works.

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WEST'S GAS IMPROVEMENT CO. LTD • MILES PLATTING • MANCHESTER 10

STOCK AND SHARE LIST

Official Quotations on the London Stock Exchange

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 15	Rise or Fall on Week.	Transaction Lowest and Highest Prices During the Week.
1,767,439	Stk.	Sept. 6	8	8	Alliance & Dublin Ord. ...	163—168	...	...
374,000	,,	June 21	4	4	Do. 4 p.c. Deb. ...	95—100	...	...
558,890	,,	Aug. 9	7	7	Barnet Ord. 7 p.c.	158—163	...	160—161
300,000	1	Oct. 4	1/9⅜	1/4½	Bombay, Ltd.	26'—28'-*	...	27/3—27/6
179,915	Stk.	Aug. 9	9½	9½	Bournemouth sliding scale ...	200—205	...	...
590,407	,,	,,	7	7	Do. 7 p.c. max. ...	158—163	...	162½
493,960	,,	,,	6	6	Do. 6 p.c. Pref. ...	133—138	...	...
50,000	,,	June 21	3	3	Do. 3 p.c. Deb. ...	79—84	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	98—103	...	102
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	116—121	...	...
357,900	,,	Aug. 9	7½	7½	Brighton, &c., 6 p.c. Con. ...	152—157	...	...
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	135—140	...	135
205,500	,,	,,	6	6	Do. 6 p.c. 'B' Pref.	127—133	...	...
855,000	,,	Sept. 20	8	7	British Ord.	146—151	...	147—148
100,000	,,	June 21	7	7	Do. 7 p.c. Pref.	140—145	...	...
350,000	,,	,,	5⅜	5⅜	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...	...
120,000	,,	June 7	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	102—107	...	...
450,000	,,	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1½—2½	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1½—3½	...	...
150,000	Stk.	June 21	4½	4½	Do. 4½ p.c. Deb. ...	79—84	...	...
626,860	,,	July 19	6	6	Cardiff Con. Ord.	125—130	...	...
237,860	,,	June 7	5	5	Do. 5 p.c. Red. Deb.	107—112	...	...
98,936	1	Oct. 4	2/-	2/-	Colombo Ord.	1⅛—1⅛*	...	...
24,510	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	23.6—25.6*	...	...
739,453	1	Oct. 4.	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	17/—19/-*	...	...
296,144	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	22'—24'-*	...	...
1,775,005	Stk.	Aug. 9	5	5	Commercial Ord.	85—90	...	86
620,000	,,	June 7	3	3	Do. 3 p.c. Deb. ...	74—79	...	...
286,344	,,	Aug. 23	5	5	Do. 5 p.c. Deb. ...	113—118	...	...
807,560	,,	Aug. 9	7	7	Croydon sliding scale ...	140—145	...	...
644,590	,,	,,	5	5	Do. max. div.	108—113	...	...
620,385	,,	June 21	5	5	Do. 5 p.c. Deb.... ...	113—118	...	...
239,000	,,	Aug. 9	5	5	East Hull Ord. 5 p.c.... ...	98—103	...	...
185,355	,,	Aug. 9	6	6	East Surrey Ord. 5.p.c. ...	120—125	...	...
176,211	,,	June 7	5	5	Do. 5 p.c. Deb. ...	113—118	...	...
250,000	1	July 5	4	7	Gas Consolidation Ord. ...	20/—22/-	...	...
250,000	1	May 24	4	4	Do. 4 p.c. Red Cum. Pref.	19/—21/-	...	...
19,255,284	Stk.	Aug. 9	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	23 6—24/6a	...	23/7½—24/4½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	82—85	...	83½—84½
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	99—102	...	99—101
2,993,000	,,	July 5	...	3½	Do 3½ p.c. Red. Pref.	100—103	...	101½—102½
8,602,497	,,	May 24	3	3	Do. 3 p.c. Con. Deb....	76—79	...	77½—79
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	111—114	...	112—113½
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb....	111—114	...	112—112½
700,000	,,	Sept. 6	3½	3½	Do. 3½ p.c. Red. Deb....	94—99	...	...
270,466	,,	Aug. 23	6	6	Harrogate New Cons. ...	115—120	−5	...
213,200	,,	Aug. 9	6	6	Hornsey Con. 3½ p.c. ...	118—123	...	...
5,600,000	,,	May 24	8	12	Imperial Continental Cap. ...	135—140	...	136—138½
223,130	,,	July 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...	...
285,242	,,	Aug. 9	8½	8½	Lea Bridge 5 p.c. Ord. ...	170—175	...	...
75,000	,,	May 24	†10	†10	Malta & Mediterranean ...	150—160	...	...
					Metropolitan (of Melbourne)			
392,000	—	Oct. 1	5½	5½	5½ p.c. Red. Deb.	100—103	...	...
231,978	Stk.	Aug. 23	5	5	M.S. Utility 'C' Cons. ...	101—106	...	...
968,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	96—101	...	95
360,075	,,	June 21	4	4	Do. 4 p.c. Deb. ...	97—102	...	98
148,955	,,	,,	5		Do. 5 p.c. Deb. ...	115—120	...	...
125,000	—	July 1	3½	3½	Do. 3½ p.c. Rd.Rg.Bds.	96—99	...	...
675,000	Stk.	May 3	†6	†9	Montevideo, Ltd.	91—96	...	...
250,000	,,	Aug. 9	7½	7½	North Middlesex 6 p.c. Con.	150—160	...	...
396,160	,,	Aug. 9	5	5	Northampton 5 p.c. max. ...	110—115	...	...
300,000	,,	Apl. 19	†9	†7	Oriental, Ltd....	162—167	...	...
468,537	,,	June 7	8	8	Plymouth & Stonehouse 5 p.c.	157—162	−2½	158
621,667	,,	Aug. 9	8¼	8¼	Portsmouth & Gosport Cons.	164—169	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	104—109	...	...
73,350	,,	,,	5	5	Do. 5 p.c. Pref. ...	110—115	...	...
441,275	1	Sept. 20	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	21/6—23.6	...	...
460,810	1	,,	-/10⅜	-/10⅜	,, ,, 4½ p.c. Cum. Pref.	19.6—21/6	...	20/6
133,201	Stk.	Aug. 23	5	8¼	Shrewsbury 5 p.c. Ord. ...	130—135	...	...
1,371,752	1	Sept. 6	1/2⅜	1/2⅜	South East'n Gas. Cn.Ld. Ord.	23'—25/-	...	23/9—24/3
871,636	1	,,	-/10⅜	-/10⅜	Do. 4½ p.c. Red. Cum. Pref.	20/—22/-	...	...
498,818	1	,,	4	4	Do. 4 p.c. Cum. Pref. ...	18'—20/-	...	20/3
450,000	Stk.	Aug. 9	4	4	Do. 4 p.c. Deb.	99—102	...	...
150,000	,,	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	96—99	...	...
6,709,895	,,	Aug. 9	6	5	South Met. Ord.	100—103	−1	101—102¾
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	130—135	...	133—134
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	98—101	...	100—101
1,895,445	,,	June 21	3	3	Do. 3 p.c. Deb. ...	75—80	...	77¾
1,000,000	,,	July 5	5	5	Do. 5 p.c. Red. Deb....	110—113	...	111
1,543,795	,,	Aug. 9	6	6	South Suburban Ord. 5 p.c....	120—125	...	121½—125
512,825	,,	,,	5	5	Do. 5 p.c. Pref....	110—115	...	112—113½
500,000	,,	,,	4	4	Do. 4 p.c. Pref....	95—100	...	97½
250,000	,,	,,	...	§18/9	Do. 3¾ p.c. Red. Pref.	98—101	...	...
888,587	,,	June 7	5	5	Do. 5 p.c. Deb....	115—120	...	115—117
250,000	,,	,,	4	4	Do. 4 p.c. Deb....	98—101	...	...
200,000	,,	Sept. 20	...	3½	Do. 3½ p.c. Red. Deb.	94—99	...	...
427,859	1	May 3	9⅜	1/2⅜	S. Western Gas & Water Ord.	19/—21/-	...	...
160,523	1	Apl. 19	-/10⅜	-/10⅜	Do. 4½ p.c. Red. Cum. Pf.	20/—22/-	...	21/3
110,000	Stk.	June 21	4	4	Do. 4 p.c. Red. Deb. ...	97—102	...	...
750,541	,,	Aug. 9	5⅜	5	Southampton Ord. 5 p.c. ...	111—116	...	113—115⅜
148,836	,,	June 7	4	4	Do. 4 p.c. Deb.	97—102	...	...
350,000	,,	Aug. 23	5½	5½	Swansea 5½ p.c. Red. Pref. ...	110—115	...	111½
94,000	,,	June 7	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	95—100	...	...
1,076,490	,,	Aug. 9	6⅝	6⅝	Tottenham and District Ord.	133—138	−2	133
409,835	,,	,,	5⅜	5⅜	Do. 5⅜ p.c. Pref....	121—126	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	110—115	...	...
371,850	,,	June 7	4	4	Do. 4 p.c. Deb. ...	97—102	...	...
888,629	1	Oct. 4	6	4	U. Kingdom Gas Cor. Ord.	20/—22/-*	...	20/—20/10½
968,841	1	May 3	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	20/—22/-	...	21/—21/4½
745,263	1	June 7	4½	4½	Do. 4½ p.c.2nd Non-Cum.Pf.	17/—19/-	...	17/6—18/6
1,000,000	Stk.	Sept. 20	3½	3½	Do. 3½ p.c. Red. Deb. ...	96—99	...	97¾
373,939	,,	Aug. 9	7	7	Uxbridge, &c., 5 p.c. ...	138—143	−9	139
133,010	,,	,,	5	5	Do. 5 p.c. Pref. ...	109—114	...	...
1,371,138	,,	Aug. 9	7	7	Wandsworth Consolidated ...	140—145	...	140½—141½
1,620,615	,,	,,	5	5	Do. 5 p.c. Pref. ...	117—122	...	...
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	97—100	...	...
1,343,964	,,	June 7	5	5	Do. 5 p.c. Deb. ...	115—120	...	115
383,745	,,	,,	4	4	Do. 4 p.c. Deb. ...	97—102	...	...
558,342	,,	Aug. 9	7	7	Watford and St. Albans Ord.	138—143	−2	140
200,000	,,	,,	5	5	Do. 5 p.c. Pref. ...	109—114	...	...
200,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	121—126	...	...
200,000	,,	June 7	4	4	Do. 4 p.c. Red. Deb.	97—102	...	99
100,000	,,	,,	3½	3½	Do. 3½ p.c. Red.Deb.	95—100	...	...

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BRISTOL EXCHANGE.								
347,756	Stk.	July 19	6	5	Bath Cons.	120—122	...	...
1,667,250	,,	July 19	5	5	Bristol, 5 p.c. max.	117—118	...	...
120,420	,,	June 7	4	4	Do. 1st 4 p.c. Deb. ...	100¼—102½	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	100¼—102½	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	120—123	...	...
274,000	,,	July 19	5	5	Newport (Mon.) 5 p.c.max. ...	101—106	...	...
13,200	12	Sept. 6	8	7	Pontyp'l Gas & W. 10 p.c. 'A'	13—14	...	...
13,600	10	,,	6	5	Do. 7 p.c. 'B'	11⅞—12⅛	...	...
40,000	10	,,	6	5	Do. 7 p.c. 'C'	11⅞—12⅛	...	...
140,778	Stk.	Aug. 9	5	5	Weston-super-Mare Cons. ...	110—112	...	...
64,338	,,	June 21	4	4	Do. 4 p.c. Deb.	96—98	...	...
33,340	,,	,,	7½	7½	Do. 7½ p.c. Deb.	157—160	...	...
LIVERPOOL EXCHANGE.								
157,150	Stk.	Aug. 9	6½	5	Chester 5 p.c. Ord.	104—109	...	...
92,500	,,	June 21	4	4	Do. 4 p.c. Pref.	97—101	...	
36,430	,,	,,	3½	3½	Do. 3½ p.c. Deb.... ...	89—92	...	...
41,890	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	98—102	...	...
2,167,410	,,	Aug. 23	6	6	Liverpool 5 p.c. Ord. ...	125—127	...	...
245,500	,,	June 21	5	5	Do. 5 p.c. Red. Pref. ...	99—104	...	...
306,083	,,	July 1	4	4	Do. 4 p.c. Deb. ...	102—104	...	...
106,280	,,	Aug. 9	10	10	Preston 'A' 10 p.c.	206—216	...	...
188,219	,,	,,	7	7	Do. 'B' 7 p.c.	147—157	...	...
NEWCASTLE EXCHANGE.								
122,577	Stk.	Aug. 9	8	8	Blyth 5 p.c. Ord.	165—166	...	...
732,000	,,	Aug. 9	5	5	Hartlepool G. & W. Cn. & New	121—123	–½	...
2,061,315	,,	Aug. 9	5⅜	5	Newcastle & Gateshead Con.	23/9—24/3a	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	99—100	...	...
776,706	,,	June 21	3½	3½	Do. 3½ p.c. Deb. ...	91—92	...	...
277,285	,	Nov. 2	5	5	Do. 5 p.c. Deb. '43...	108—109	...	...
332,351	,	Aug. 23	6	6	Sunderland 6 p.c. max. ...	139—141	...	...
NOTTINGHAM EXCHANGE.								
542,270	Stk.	Aug. 9	9	6	Derby Con.	140—150	...	...
55,000	,,	June 7	4	4	Do. 4 p.c. Deb. ...	100—105	...	...
20,000	10	June 7	5	5	Long Eaton 5 p.c. Pref. ...	10—12	...	...
80,000	Stk.	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...	...
SHEFFIELD EXCHANGE.								
10,000	Stk.	Sept. 20	10	10	Great Grimsby 'A' Ord. ...	210—220	...	...
6,500	,,	,,	10	10	Do. 'B' Ord. ...	210—220	...	...
79,000	,,	,,	10	10	Do. 'C' Ord. ...	205—210	...	...
1,806,339	,,	Aug. 23	6	6⅔	Sheffield Cons.	145—149	...	...
95,000	,,	July 5	4	4	Do. 4 p.c. Deb.	100—103	...	...
Supplementary List of Stocks and Shares not Officially Quoted								
202,152	Stk.	Sept. 6	25/-b	5	Ascot Ord.	100—105	...	...
128,182	,,	July 5	5	5	Do. 5 p.c. Pref.	108—113	...	...
573,156	1	May 24	5	5	Assd. Gas and Water Ord. ...	19/6—21/6	...	19/6
167,506	1	...	...	...	Do. 4 p.c. Red. Cum. Pref.	19/—20/-	...	20/-
253,118	1	...	...	...	Do. 4 p.c. Irred Pref. ...	18/—20/-	...	...
500,000	1	May 24	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/6—21/6	...	20/6
500,000	Stk.	Sept 6	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...	95—96
31,035	1	Aug. 23	...	/4½	Associated Utilities 4 p.c. Pref.	16/6—18/6	...	17/-
100,000	Stk.	...	...	...	Do. 3½ p.c. Red. Deb.	95—100	...	...
17,000	,,	Aug. 23	8	8	Bognor Orig. Ord. 'A' ...	160—170	...	...
62,210	,,	,,	8	8	Do. New Addl. 'A' ...	160—170	...	...
87,160	,,	,,	7	7	Do. New 7 p.c. max. ...	141—146	...	...
37,440	,,	Aug. 9	10	10	Cam. Univ. & Town 10 p.c.max.	193—203	...	...
125,970	,,	,,	7	7	Do. 7 p.c. max.	135—140	...	...
39,025	,,	,,	5	5	Do. 5 p.c. max.	98—103	...	...
65,000	,,	Aug. 9	8½	7½	Eastbourne 'A' 5 p.c. ...	158—163	...	...
198,000	,,	,,	7	6	Do. 'B' 3½ p.c.	128—133	...	...
112,312	,,	,,	5	5	Do. 5 p.c. Pref.	108—113	...	...
130,000	,,	June 21	5	5	Do. 5 p.c. Deb.	115—120	...	...
24,000	30	Aug. 23	8½	8½	Great Yarmouth 8½ p.c. max.	44—49	...	...
59,400	30	,,	7½	7½	Do. 7½ p.c. max.	44—49	...	...
51,160	Stk.	June 7	5½	5½	Do. 5½ p.c. Deb.	120—125	...	...
152,600	,,	Sept. 6	9	8	Guildford Cons.	170—175	...	...
54,055	,,	,,	5	5	Do. 5 p.c. Pref.	110—115	...	...
68,250	,,	June 7	5	5	Do. 5 p.c. Deb.	113—118	...	...
156,600	,,	Aug. 23	7½	7½	Hampton Court Cons. ...	158—163	...	...
73,620	,,	Sept. 6	8½	8½	Luton Cons. 'A'	163—168	...	...
107,960	10	Sept. 20	5½	4	Mid Kent Ord.	8¾—9¾	...	...
230,940	Stk.	Aug. 9	10	10	Oxford & District Ord. ...	205—210	+2	209—210
47,112	,,	,,	5	5	Do. 5 p.c. Pref.	108—113	...	...
50,000	,,	,,	6	6	Do. 6 p.c. Red. Pref. ...	110—115	...	...
126,193	,,	May 3	7½	7½	Peterborough Ord.	159—169	...	...
64,990	,,	Sept. 6	7½	6¾	Redditch Ord.	125—135	...	...
166,850	,,	Aug. 9	8	8	Romford Ord.	155—165	...	...
60,000	,,	,,	4	4	Do. 4 p.c. Pref.	97—100	...	...
44,000	,,	Sept. 20	5	5	Do. 5 p.c. Deb.	113—118	...	...
25,570	,,	Aug. 9	5½	5½	Rugby 5½ p.c. Pref.	125—130	...	...
25,000	,,	,,	6	6	Do. 6 p.c. Red. Pref. ...	106—111	...	...
42,750	,,	June 7	5½	5½	Do. 5½ p.c. Deb.	122—127	...	...
10,950	,,	Aug. 23	8	8	Ryde Ord.	158—163	...	...
27,825	,,	Aug. 23	8	8	Shanklin & Ventnor Cons. ...	158—168	...	...
270,086	,,	Sept. 6	7	7	Slough Ord.	135—140	...	...
21,000	,,	June 21	5	5	Do. 5 p.c. Deb.... ...	112—117	...	...
28,872	1	May 24	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	19/—21/-	...	...
28,866	1	Sept. 6	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	18/6—20/6	...	...
137,730	Stk.	Aug. 9	7	7	Southgate & Dist. 7 p.c. max.	140—145	...	...
62,500	,,	,,	5	5	Do. 5 p.c. Pref.	110—115	...	114½
117,228	,,	Aug. 23	5	5	Swindon Cons.	106—111	...	...
60,425	,,	June 7	5	5	Do. 5 p.c. Deb.	110—115	...	...
64,380	,,	June 7	5	5	Torquay and Paignton 5 p.c. Pf	110—115	...	...
500,000	1	...	...	...	United Kingdom Gas Corpn. 4 p.c. 1st Red. Cum. Pref.	19/—21/-	...	19/9—20/3
130,000	Stk.	Aug. 9	8	5	Wakefield Ord.	120—125	...	...
81,650	,,	,,	5	5	Do. 5 p.c. max.	103—108	...	...
82,000	,,	Aug.	6	6	Weymouth Ord.	103—108	...	...
98,384	,,	Aug. 9	6	6	Wolverhampton 6 p.c. Pref. ...	125—130	...	...
160,000	,,	June 21	5½	5½	Do. 5½ p.c. Rd. Db	108—113	...	...
90,000	,,	June 21	5	5	York 5 p.c. Red. Deb. ...	105—110	...	...
133,640	,,	July 19	6½	6½	Yorktown (Cam.) 5 p.c Cons.	128—133	...	...
120,000	,,	,,	5	5	Do. 5 p.c. Pref.	108—113	...	...
35,000	,,	June 7	5½	5½	Do. 5½ p.c. Deb.	123—128	...	...

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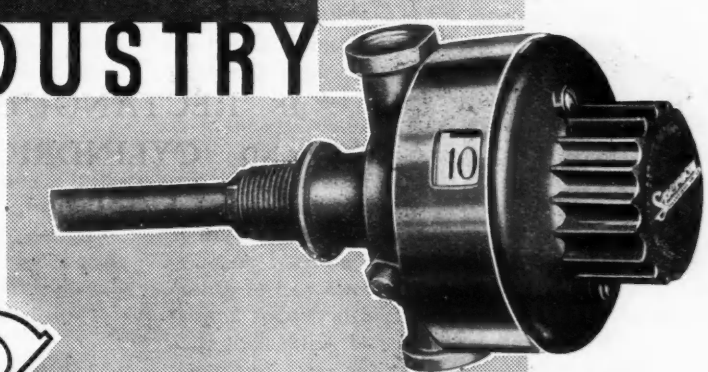

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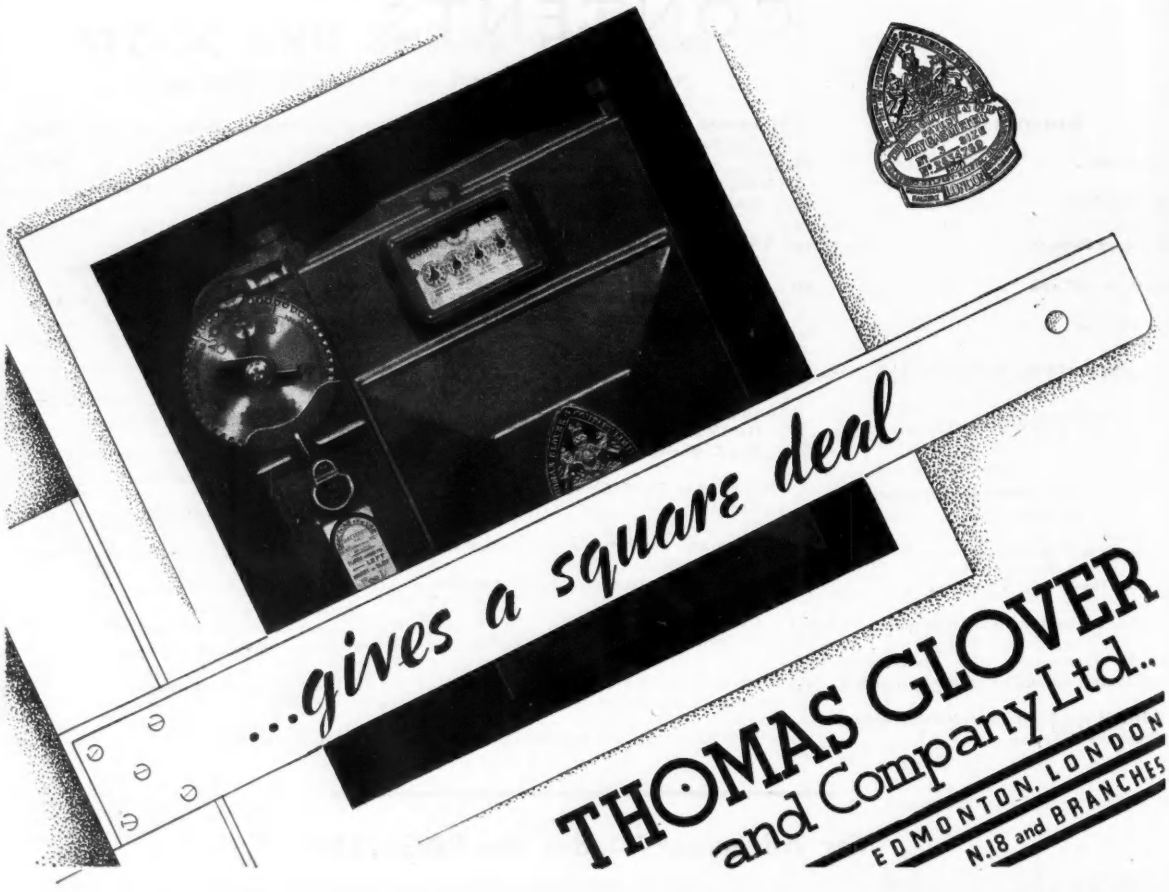

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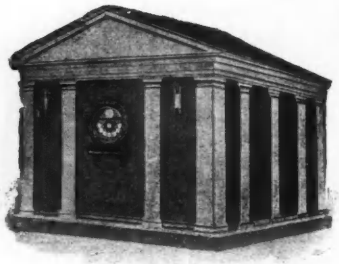

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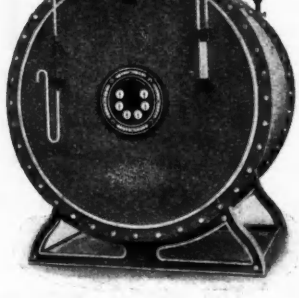

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